

AUGMENTED FISH HEALTH MONITORING

ANNUAL REPORT

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## ABSTRACT

Augmented Fish Health Monitoring Contract DE-AI79-87BP35585 was implemented on July 20, 1987. This report briefly describes third-year work being done to meet contract requirements for fish disease surveillance at Service facilities in the Columbia River basin and for histopathological support services provided to participating state agencies. It also summarizes the health status of fish reared at participating Service hatcheries and provides a summary of case history data for calendar year 1989. Items of note included severe disease losses to infectious hematopoietic necrosis (IHN) in summer steelhead trout in Idaho, the detection of IHN virus in juvenile spring chinook salmon at hatcheries on the lower Columbia River, and improved bacterial kidney disease (BKD) detection and adult assay by enzyme-linked immunosorbent assay (ELISA) technology at the Dworshak Fish Health Center. Complete diagnostic and inspection services were provided to 13 Columbia River Basin National Fish Hatcheries. Case history data was fully documented in a computerized data base for storage and analysis and is summarized herein.

## INTRODUCTION

This report covers the third year of activity carried out by the U. S. Fish and Wildlife Service under Augmented Fish Health Monitoring Contract DE-AI79-87BP35585. The Service operates three Fish Health Centers serving the 13 Columbia River basin National Fish Hatcheries (NFH's) (Table 1.). These fish health centers (FHC) are located at Olympia, Washington, the Dworshak NFH near Orofino, Idaho, and at the Spring Creek NFH on the Washington side of the Columbia River across from Hood River, Oregon. Each FHC provides viral, bacterial, parasitic and non-infectious disease diagnostic and fish health monitoring services to the facilities in their geographical area. In addition, complete laboratory facilities and half-time personnel are supported by the contract at the Olympia FHC for histopathological and electron microscopy services. These services also are available to the four state agencies participating in the BPA-sponsored Augmented Fish Health Monitoring program. Each FHC has computers for data storage and analysis. The Service's Regional Fish Health Manager, located in the Portland, Oregon Regional Office coordinates, but does not supervise, the activities of the FHC's and serves as the Service's Technical Representative. Data summaries, periodic reports and other submissions required by the contract are prepared from the computer database and written reports from the fish health centers and provided to BPA by the Technical Representative.

## MATERIALS AND METHODS

Complete fish health monitoring was carried out on adult and juvenile salmon and steelhead trout at each of the 13 NFH's. Sampling and laboratory procedures used were those listed in the Fish Health Section - American Fisheries Society "Bluebook" of diagnostic techniques (Amos, 1985), those required by the Service's fish health protection program, or those required to meet requirements set forth for the contract by the interagency steering committee. The results of this work have been reported in the Service's fish health database and summarized in quarterly reports already submitted.

Fish health monitoring consists of the on-site monthly observation of overall fish health by trained fish pathologists, the collection and analysis of microbiological samples from both juvenile and spawning adult Pacific salmon and steelhead trout, the annual pre-release monitoring of organosomatic indices of fish health and quality, and the use of complete histopathological services to confirm and support clinical diagnoses. Service funds support most of the work done but contract funds increase the frequency of on-site visits, enable increased surveillance on the prevalence of BKD in juvenile spring chinook, support the sampling of adult and juvenile salmon and steelhead trout for erythrocytic inclusion body syndrome (EIBS) and Ceratomyxa Shasta, make possible the monitoring of organosomatic indices, and provide about half of the funds and personnel required to meet needs for histopathological support to diagnostic activities.

## RESULTS AND DISCUSSION

Service fish health monitoring activities supported by the Augmented Fish Health Monitoring contract fall into three major categories. Determination of organosomatic indices of smolt health and quality is carried out on "B" strain summer steelhead at the Dworshak NFH and on "tule" fall chinook at the Spring Creek NFH. Second, there is complete on-site fish health monitoring for infectious disease detection and diagnosis. Third, histopathological support is provided for Service fish health monitoring activities and is available to state agencies participating in the Augmented Fish Health Monitoring program.

### Determination of Organosomatic Indices

Organosomatic indices are an array of morphometric, physiological, and clinical chemistry measurements collected to document the physical condition of fish. The system is predicated on the idea that fish survival, contribution to fisheries, or return for spawning (performance) can be linked to one or more measurable physiological characteristics. This is a prospective study. The relationship between fish performance and their organosomatic indices during rearing or at the time of release cannot be determined until a bank of data has been collected.

Service personnel at the Dworshak FHC and at the Lower Columbia FHC use a Lotus 1-2-3 spread sheet program developed by Ron Goede, fish pathologist for the state of Utah, who developed the organosomatic indices concept and trained Pacific Northwest fish pathologists in its use. According to Goede, attention should be paid to the standard deviations occurring among hematocrits (packed red blood cell volume), condition factors, and to the percentage of fish with mesenteric fat in the 2 and 3 categories.

Sampling of "B" strain summer steelhead at Dworshak NFH has been conducted for two years. In the past year a total of 240 fish were individually dissected and examined (Table 2.). In each case, changes could be noted as smoltification progressed. Changes in body condition factor, gills, and internal fat could be correlated with the onset of smoltification. Nothing strikingly unusual was noted and no problems were encountered.

Tule fall chinook sampling at Spring Creek NFH has consisted of individual examinations of 200 or more random fish per release group. In the past year, over 800 fish were sampled (Table 3.). Great care is taken in weighing fish because large errors can be introduced when cubic factors are applied in the calculation of condition factors. Excellent health and quality has been documented in Spring Creek tule fall chinook released in the last three years. Onset of smoltification has been correlated with minor increases in descaling.

## Monitoring for Infectious Diseases of Hatchery Fish

**Infectious Hematopoietic Necrosis (IHN)**-- Both spawning adults and juvenile production fish are regularly monitored for the presence of IHN virus. There seems to be no relationship between the prevalence of IHN virus in spawning adults and the subsequent occurrence of IHN in their progeny. IHN virus prevalence in spawning adults seems to be correlated more closely with location than with fish stocks. Local brood stock holding environments may be an important factor governing the prevalence of IHNV in adults by the time the fish spawn.

At lower Columbia River NFH's IHN prevalences were high in spawning adults but subsequent losses of juveniles were either low or non-existent. At Little White Salmon sampling of the adult spring chinook showed high virus prevalences as follows:

	<u>Males</u>	<u>Females</u>	Percent Prevalence		
			<u>Males</u>	<u>Females</u>	<u>Population</u>
Spring chinook	58/142	2651336	40.8	78.9	67.6
Coho	2/52	51/154	3.8	33.1	25.2
Up-river bright FCS	27169	89/221	39.1	40.3	40.0

At Carson NFH 90% of spawning females and 55% of the males were IHNV positive.

A low prevalence of infectious hematopoietic necrosis (IHN) virus was detected in adult summer steelhead spawned on all spawning dates at the Dworshak NFH. Virus prevalence in females ranged from 0/170 (0%) in take 8 to a high of 7/120 (5.8%) in take 3. IHNV prevalence in males ranged from 0/67 (0%) in take 4 to 6/67 (9.0%) in take 1. This data alone provides little evidence of a relationship between IHNV prevalence in adults and the occurrence of IHN in their progeny. Data on the proportion of adults with high levels (titers) of virus and the amounts of virus present in ovarian fluids may be helpful.

IHN caused the loss of the greatest number of fish reared in the 13 Columbia River NFH's. Losses of "B" steelhead juveniles to IHN were much reduced at the Dworshak NFH in 1990 in comparison to recent years. This may be related to the high water flows discharged from Dworshak reservoir this spring and early summer. It is speculated that previously abundant carrier fish or virus particles above the Dworshak water intake, may have been physically washed downstream. Reduced incidence of IHN has also been noted in other years of high water flows. Low level losses to IHN occurred among spring chinook juveniles at Carson and Little White Salmon NFH's and caused the destruction of rainbow trout reared at the Warm Springs NFH.

Also of note, IHN virus was isolated from 7 of 93 naturally spawned out carcasses of upriver bright fall chinook salmon snagged by tribal fishery officers on the Yakima Indian Reservation.

**Infectious Pancreatic Necrosis (IPN)** -- IPN virus was detected in 6/pound rainbow trout reared at the Warm Springs NFH. The source of the virus is believed to be free-ranging trout in the headwaters of the Warm Springs River system. The fish were destroyed. At the Leavenworth NFH IPN virus was detected in spawning summer steelhead. Because IPN virus is egg-transmissible, the entire lot of 75,000 eggs was destroyed.

**Erythrocytic Inclusion Body Syndrome (EIBS)** -- The geographic distribution of erythrocytic inclusion body syndrome (EIBS) has grown with the first-time discovery of EIBS inclusion bodies in blood smears taken from pre-e-release spring chinook salmon smolts reared at the Dworshak NFH in Idaho's Clear-water River basin. At the Entiat NFH, EIBS severely complicated an already serious BKD problem in pre-smelts reared under adverse environmental conditions in the brood holding pond. At the Little White Salmon NFH, 6.7% of the spring chinook smolts were found positive for EIBS inclusion bodies during pre-release examinations. At the Carson NFH, EIBS prevalence was below 20% in December 1989, but grew to over 50% in some raceways by February 1990. Several tests were conducted on the Carson fish to better describe the blood cell types present in infected fish and to determine the effects of EIBS on smolts. By release time in April, the fish were in good condition, but inclusion bodies still could be found in a few fish.

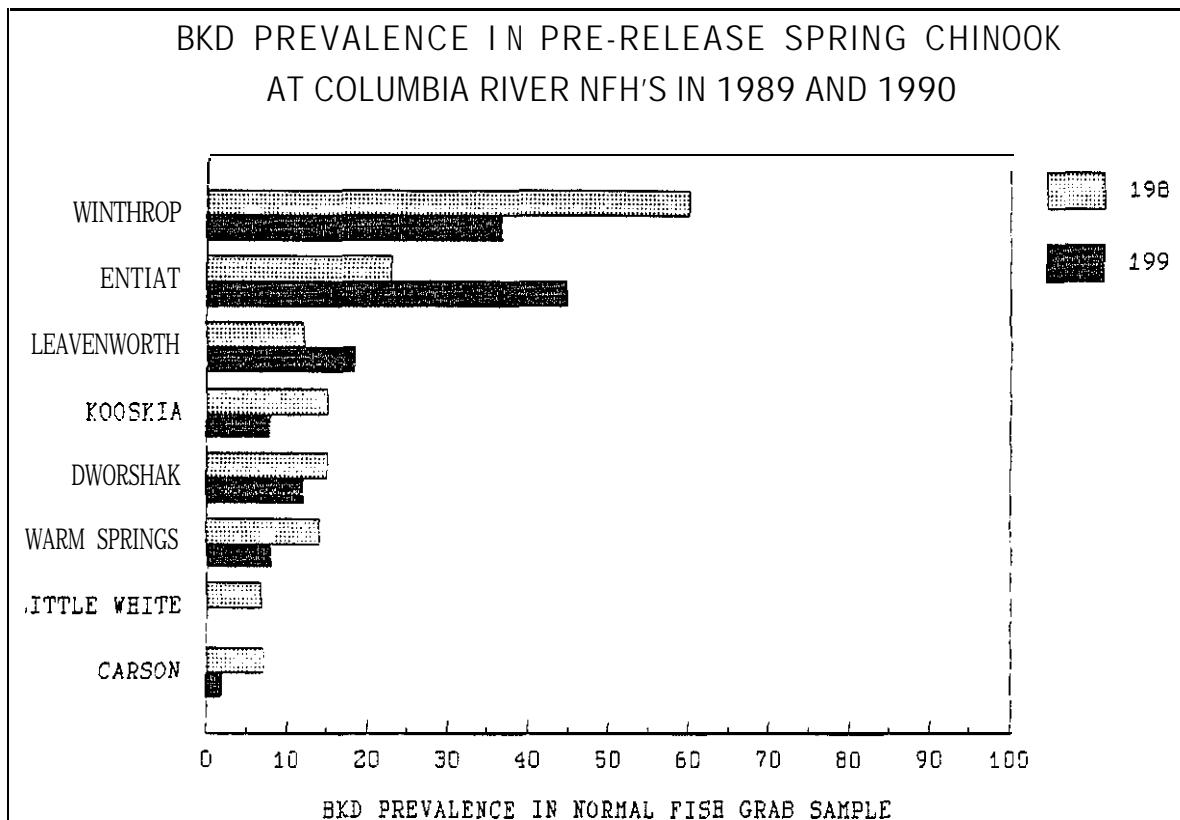
**Bacterial Kidney Disease (BKD)** -- Data on the occurrence of BKD in Columbia River basin spring chinook adults and juveniles is long and complex. Highlights include an obvious correlation between the observed severity of infections in adults and the incidence and severity of the disease in their progeny. "Normal" prevalences among smolts can be placed in the 5 to 15% range. Above that range BKD can cause severe impairment in migrating smolts.

A total of 1,750 spawning adult spring chinook salmon were tested at Dworshak NFH by means of ELISA-BKD techniques to determine kidney tissue levels of soluble antigen produced by Renibacterium salmoninarum. The data obtained was sorted into "negative, light, moderate, and heavy" categories according to the optical density levels indicated:

	<u>Negative</u>	<u>Light</u>	<u>Moderate</u>	<u>Heavy</u>
Optical density	.000-.099	.100-.200	.200-.500	.500-up
Number of fish	963	588	68	131
Percent of pop.	55.0	33.6	3.9	7.5

These data were used to identify which spawns should be segregated into high and low BKD groups for experimental purposes and to avoid transferring eggs from high-antigen parents to Kooskia NFH for incubation. To date the premise that low-antigen parents beget progeny with low BKD levels and high-antigen parents beget progeny with high-BKD levels holds true.

In March and April, pre-release grab samples of 60 mid-pond yearling spring chinook were examined for bacterial kidney disease (BKD) by FAT at each of the eight National Fish Hatcheries rearing this chinook strain in the Columbia River basin. Figure 1. compares the results of the spring 1990 pre-release BKD prevalence examinations with those of the spring of 1989.



**Figure 1.** Spring-time prevalence of BKD in pre-release spring chinook salmon smolts reared at Columbia River National Fish Hatcheries.

Major caveats on this data must be kept in mind. First, this data is based on 60-fish grab samples collected from mid-pond fish, not from sampling of a densely crowded population with random sampling equipment. Second, the samples were collected by different field personnel and prepared and analyzed by different laboratory personnel. Finally, it must be noted that the vast majority of the fish found positive for BKD bore light infections. These findings already have caused the hatchery and fish health personnel involved to again examine fish cultural methods and fish disease control programs to make improvements wherever possible,

**Bacterial Coldwater Disease (BCWD)** -- Data collected and analyzed from work carried out under this contract has shown a strong correlation between the stresses of crowding and low water exchange rates during the early rearing of coho salmon fingerlings and the incidence and severity of BCWD. Corrective action to prevent over-crowding of coho fry and early fingerlings at the

Willard NFH has greatly reduced BCWD impacts after several years of difficulty with this disease. BCWD remains a persistent and debilitating problem among coho reared at the Eagle Creek NFH where oxytetracycline therapy did not provide a long-term remedy and mortalities and deformed fish persisted after treatment.

At the Winthrop NFH, low levels of bacterial coldwater disease were detected during an episode of concurrent "fuzzy tail" and EIBS. The relationship between the three is unclear.

Leavenworth summer steelhead trout continue to suffer from low levels of bacterial coldwater disease. These fish have undergone routine oral oxytetracycline therapy but the persistence of the infection may be because Cytophaga psychrophila bacteria sequester themselves in and around the central nervous system out of reach of therapeutants.

**Furunculosis** -- Aeromonas salmonicida, the causative agent of furunculosis, is frequently detected in pre-spawning adult spring chinook. At times, furunculosis can cause pre-spawning mortalities, however, during the past year no fish losses were attributed to furunculosis.

**Enteric Redmouth (ERM)** -- In past years, ERM caused losses in summer steelhead reared at the Hagerman NFH. This year ERM occurred in Hagerman "A" strain summer steelhead and required a course of antibiotic therapy. In 1989, the tule fall chinook at Spring Creek were free of the disease for the first time since 1973. Rigorous sanitation of the oyster shell filter beds with large quantities of formalin seems to have halted problems with ERM and Ichthvophthirius both of which could impair migration or seawater adaptation. Good contribution to the fishery and a high return rate to the hatchery is expected of the 1988 brood year tule fall chinook from Spring Creek.

**Whirling Disease (Myxobolus cerebralis)** -- Juvenile anadromous fish, older than five months of age and reared in facilities supplied with surface water, were examined for the presence of M. cerebralis. Neither whirling disease nor the causative agent were detected at any of the 13 Columbia River basin NFH's during the past year.

**Ceratomyxosis(Ceratomyxa Shasta)** -- Adult anadromous salmonids that died prior to spawning and juveniles reared in facilities supplied with surface water during September and October were screened for C. Shasta. C. Shasta was detected in 18% of the adult winter steelhead returning to the Eagle Creek NFH and in 30% of the fall chinook salmon returning to the Abernathy Salmon Culture Technical Center, but ceratomyxosis was not diagnosed as a cause of mortality during post-mortem examinations of adult salmon dying before they could be spawned. C. Shasta was not detected in juveniles.

See Table 4. for a station by station summary of fish health status. A chronological summary cases reported from January 1, 1989 through May 15, 1990 can be found in Appendix I

## Histopathological Support Services

Histopathological support services between July 1, 1989 and June 30, 1990 involved processing 2,713 samples. In addition to these routine histological services a total of 98 sets of samples were processed during this period for ultra-structural examination by electron microscopy.

Histological samples from Hagerman summer steelhead fingerlings revealed the presence of an intranuclear microsporidean infection similar, if not identical to the organism previously reported in Washington and California fall chinook salmon. Examination of sections collected in 1988 showed the previous year-class also to have been infected.

The Service's Bozeman Fish Technology Center has loaned the Olympia Fish Health Center equipment to enable plastic embedding of histological samples. Plastic embedding helps to produce more clearly defined and thinner sections for staining and examination. These arrangements were made at no cost to BPA.

## PROJECT STATUS BY OBJECTIVE AND TASK

The Statement of Work in Augmented Fish Health Monitoring contains Six objectives. At the end of the second year of this project, the accomplishment status of each Objective, and the Tasks listed therein, is as follows:

Objective 1 .0: Complete Start-up Phase

Objective 2.0: Serve on the Project Technical Steering Committee

Task 2.1 Attend Technical Steering Committee meetings . . . . On-going

Task 2.3 Submit a list of “facility impediments” to fish health Completed

Objective 3.0: Conduct Augmented Fish Health Monitoring

Task 3.1 Perform organosomatic analyses On-going

Task 3.2 Conduct field work identified in Table 2.1 (On schedule; no problems foreseen.) On-going

Task 3.2.1 Provide histopathological support services for

State and Service participants. (Half-time support was provided throughout the year). . . On-going

Objective 4.0: Conduct Studies of Hatchery Water Supplies

- Task 4.1 Submit a water sampling plan . . . . . Completed
- Task 4.2 Collect and analyze water samples. Work awaits BPA guidance and contract. . . . . On-going
- Task 4.3 Determine/record flow and density indices  
(This data is recorded on each case history.). On-going

Objective 5.0: Coordinate, Record, Analyze and Report Fish Health Monitoring and Related Data

- Task 5.1 Submit forms and formulae . . , . . . . . Completed
- Task 5.2 Record data (Over 3,000 case histories in computerized database at this time) . . . . . On-going
- Task 5.3 Submit quarterly data summaries . . . . . On-going
- Task 5.4 Coordinate databases with other agencies (Awaiting guidance). . . . . On-going

Objective 6.0: Estimate the Project's Benefits

- Task 6.1 Report Table 2.3 data for all Table 2.2 facilities for three years prior to start of contract . . Completed
- Tasks 6.1.1 through 6.1.5 Existing data required for these sub-tasks is scattered in several different files and forms in hatchery records and in Regional Office files. Awaiting guidance. . . On-going

CONCLUSIONS

Participation by the Fish and Wildlife Service in this interagency project has been productive since the outset. Improved fish disease surveillance enhanced interagency coordination and the development of parity in diagnostic services in the field are immediate benefits. In addition, shared technology and methodology has helped all participants improve efficiency and the sensitivity of laboratory procedures.

The patient support by Ron Morinaka is appreciated. He has worked effectively to clarify contract obligations, convene and moderate Technical Steering Committee meetings, and has effectively facilitated Service efforts to meet requirements.

#### LITERATURE CITED

- Amos, K. H., Editor, 1985. Procedures for the detection and identification of certain fish pathogens. 3rd Edition. Fish Health Section, American Fisheries Society, Corvallis, Oregon. 114 p.
- Piper, R. G., I. B. McElwain, L. E. Orme, J. P. McCraren, L. G. Fowler, and J. R. Leonard. 1982. Fish hatchery management. U. S. Dept. of the Interior, Fish and Wildlife Service, Washington, D. C., 517 p.

Table 1. List of Columbia River Basin National Fish Hatcheries.

<b>Abernathy Salmon Culture Technical Center</b> <b>1440 Abernathy Road</b> <b>Longview, WA 98632</b>	<b>Tule fall chinook salmon</b>
<b>David A. Leith, Director</b>	
<b>Carson National Fish Hatchery</b> <b>Carson, WA 98610</b>	<b>Spring chinook salmon</b>
<b>Bruce M. Mc Leod, Manager</b>	
<b>Dworshak National Fish Hatchery</b> <b>P. O. Box 18</b> <b>Ahsahka, ID 83520</b>	<b>Summer steelhead trout</b> <b>Spring chinook salmon</b>
<b>Wayne H. Olson, Complex Manager</b>	
<b>Eagle Creek National Fish Hatchery</b> <b>34288 S. E. Rainbow Road</b> <b>Estacada, OR 97023</b>	<b>Coho salmon</b> <b>Winter steelhead trout</b>
<b>Douglas Dysart, Manager</b>	
<b>Entiat National Fish Hatchery</b> <b>Entiat River Road</b> <b>6970 Hatchery Drive</b> <b>Entiat, WA 98822</b>	<b>Spring chinook salmon</b>
<b>William Thorson, Manager</b>	
<b>Hagennan National Fish Hatchery</b> <b>3059-D National Fish Hatchery Road</b> <b>Hagerman, ID 83332</b>	<b>Summer steelhead trout</b>
<b>David S. Bruhn, Manager</b>	

Table 1. (Continued)

<b>Kooskia National Fish Hatchery</b> <b>Route 1, Box 98-A</b> <b>Kooskia, ID 53539</b>	<b>Spring chinook salmon</b> <b>Summer steelhead trout</b>
<b>Manager - Speros K. Doulos</b>	
<b>Leavenworth National Fish Hatchery</b> <b>P. O. Box 549</b> <b>Leavenworth, WA 98826</b>	<b>Spring chinook salmon</b> <b>Summer steelhead trout</b>
<b>Gregory A. Pratschner, Complex Manager</b>	
<b>Little White Salmon National Fish Hatchery</b> <b>P. O. Box 17</b> <b>Cook, WA 98605</b>	<b>Spring chinook salmon</b> <b>Bright fall chinook salmon</b> <b>Coho salmon</b>
<b>Jack Bodle, Complex Manager</b>	
<b>Spring Creek National Fish Hatchery</b> <b>Underwood, WA 98651</b>	<b>Tule fall chinook salmon</b>
<b>Ed La Motte, Manager</b>	
<b>Warm Springs National Fish Hatchery</b> <b>P. O. Box 790</b> <b>Warm Springs, OR 97761</b>	<b>Spring chinook salmon</b> <b>Rainbow trout</b>
<b>Gary R. White, Manager</b>	
<b>Willard National Fish Hatchery</b> <b>P. O. Box 17</b> <b>Cook, WA 98605</b>	<b>Coho salmon</b>
<b>Jack Bodle, Complex Manager</b>	
<b>Winthrop National Fish Hatchery</b> <b>P. O. Box 429</b> <b>Winthrop, WA 98862</b>	<b>Spring chinook salmon</b> <b>Lahontan cutthroat trout</b> <b>Brook trout</b>
<b>William L. Wallien. Manager</b>	

TABLE 2.

PRE-RELEASE ORGANOSOMATIC INDICES DATA

Dworshak "B" Steelhead Trout

Dworshak National Fish Hatchery

Ahsahka, Idaho

Spring 1990

SUMMARY OF FISH AUTOPSY

LOCATION: HAGERMAN NFH

QUAL. CONTROL INSPECT. NO.:

Species:	STEELHEAD	Autopsy Date:	3-6-90	Sample Size:	60
Strain:	DWORSHAK B	Age:	1 YEAR	Tissue Collection No.:	
Mark/Lot:	STTB-36,37,38			Disease Survey No.:	
Unit:	A DECK	Water Temp.:	59 F	Case History No.:	
Fish Source:	DWORSHAK	Water Hardness:	NA ppm	Custody No.:	
Egg Source:	DWORSHAK	Investigator:	K. CLEMENS		
Hatching Date:		Reason for Autopsy:	PRE-RELEASE		
Remarks:					

	MEAN	STANDARD DEVIATION	COEFFICIENT OF VARIATION
Length	207.380 mm	25.36 mm	12%
Weight	90.260 gr	32.96 gr	37%
Ktl*	1.010	0.09	9%
Ctl**	3.649		
Hematocrit	45.720	9.78	21%
Leucocrit	0.870	0.37	43%
Plasma Protein	6.700	1.9	28%

\*Expressed as Ktl times 10 to the fifth power

\*\*Converted from Ktl; expressed as Ctl times 10 to the fourth power

VALUES AS PERCENT OF TOTAL SAMPLE

PSEUDO-		MESEN.		HIND					
N	98%	N	82%	N	88%	0	95%	0	88%
B1	0%	F	3%	S	7%	1	3%	1	8%
B2	0%	C	5%	L	0%	2	2%	2	3%
E1	0%	M	0%	S&L	0%	x	0.1	3	78%
E2	0%	P	10%	I	2%			4	22%
H1	0%	O	0%	O	0%			0	NO
H2	0%					x	3.2	0	0%
M1	0%								
M2	0%								
O7	2%								

Summary of Normals

98%	82%	88%	95%	xxxxxxxx	100%	88%	97%	83%	xxxxxx	42%	100%
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Summary of Means

xxxxxxxx	xxxxxxxx	xxxxxxxx	0.1	3.2	xxxxxxxx	0.2	xxxxxxxx	xxxxxx	0.6	0.5	0
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SEX: M: 47% F: 53% U: 0%

GENERAL REMARKS

FINS 100 % DORSAL EROSION, 21/60 PECTORAL EROSION

SKIN NO PARASITES

GONADS IMMATURE

OTHER

## Qual. Control No.

SN	LGH	WGT	KtJ	EYE	GILL	PSBR	THY	FAT	SPL	GUT	KID	LIV	BILE	SEX	HEM	LEU	PLPR	FIN	OPCL
1	205	80	0.93	N	N	N	N	0										0	0
2	246	138	0.93	N	N	N	N	0										0	0
3	236	136	1.03	N	N	N	N	0										0	0
4	225	96	0.27	N	N	N	N	0										0	0
5	214	88	0.90	N	C	N	N	0										0	0
6	240	137	0.99	N	N	N	N	0										0	0
7	220	94	0.88	N	N	N	N	0										0	0
8	225	97	0.85	N	N	N	N	0										0	0
9	226	113	0.98	N	N	N	N	0										0	0
10	2109	3	1.00	N	N	N	N	0										0	0
11	232	128	1.0:	N	N	N	N	0										0	0
12	236	123	0.96	N	N	N	N	0										0	0
13	210	69	0.75	N	N	N	N	0										0	0
14	240	124	0.90	N	N	N	N	0										0	0
15	222	109	1.00	N	N	N	N	0										0	0
16	271	217	1.09	N	N	N	N	0										0	0
17	239	139	1.02	N	N	N	N	0										0	0
18	218	99	0.96	N	N	N	N	0										0	0
19	200	73	0.91	N	N	N	N	0										0	0
20	188	58	0.87	N	N	N	N	0										0	0
21	185	56	0.88	N	N	N	N	0										0	0
22	205	79	0.92	N	N	N	N	0										0	0
23	199	69	0.89	N	N	N	N	0										0	0
24	165	36	0.80	N	N	N	N	0										0	0
25	196	69	0.92	OT	N	N	N	0										0	0
26	156	26	0.68	OT	N	N	N	0										0	0
27	215	99	1.00	N	N	N	N	0										0	0
28	192	79	1.12	N	N	N	N	0										0	0
29	186	67	1.04	N	N	N	N	0										0	0
30	200	73	0.91	N	N	N	N	0										0	0
31	154	32	1.04	N	N	N	N	0										0	0
32	226	127	1.10	N	N	N	N	0										0	0
33	182	52	0.86	N	N	N	N	0										0	0
34	180	b3	1.08	N	N	N	N	0										0	0
35	106	135	1.13	H	N	N	N	0										0	0
36	193	67	0.93	N	N	N	N	0										0	0
37	187	59	0.90	N	N	N	N	0										0	0
38	212	98	1.03	N	N	N	N	0										0	0
39	221	100	0.93	N	N	N	N	0										0	0
40	194	64	0.88	N	N	N	N	0										0	0
41	226	109	0.94	N	N	N	N	0										0	0
42	215	97	0.98	N	N	N	N	0										0	0
43	191	65	0.93	N	F	N	N	0										0	0
44	212	94	0.99	N	N	N	N	0										0	0
45	210	86	0.93	N	N	N	N	0										0	0
46	205	91	1.06	N	N	N	N	0										0	0
47	192	711	1.00	N	N	N	N	0										0	0
48	237	124	0.93	N	N	N	N	0										0	0
49	230	117	0.96	N	N	N	N	0										0	0
50	200	73	0.91	N	N	N	N	0										0	0
51	202	84	1.02	N	N	N	N	0										0	0
52	195	73	0.98	N	N	N	N	0										0	0
53	186	70	1.04	N	N	N	N	0										0	0
54	215	108	1.09	N	N	N	N	0										0	0
55	200	85	1.06	N	N	N	N	0										0	0
56	206	87	1.00	N	N	N	N	0										0	0
57	205	84	0.98	N	F	N	N	0										0	0
58	236	150	1.14	N	N	N	N	0										0	0
59	217	111	1.09	N	N	N	N	0										0	0
60	211	91	0.97	N	N	N	N	0										0	0

## Qual. Control No.

SN	LGH	WGT	ktl	EYE	GILL	PSBR	THY	FAT	SPL	GUT	KID	LIV	BILE	SEX	HEM	LEU	PLPF	FIN	OPCL
1	181	59	0.99	N	N	N	N	N	N	N	N	A	1	F	47	2.0	4.2	0	0
2	201	87	1.07	N	N	N	N	N	N	N	N	B	0	F	49	1.0	5.3	0	0
3	201	81	1.00	N	N	N	N	N	N	N	N	C	1	F	49	0.5	5.8	1	0
4	192	70	0.99	N	N	N	N	N	N	N	N	D	0	F	45	0.5	2.9	0	0
5	192	72	0.94	N	N	N	N	N	N	N	N	E	1	F	49	0.5	4.8	1	0
6	172	48	0.94	N	N	N	N	N	N	N	N	F	0	F	45	0.5	6.3	0	0
7	16 <sup>9</sup>	48	0.99	N	N	N	N	N	N	N	N	G	1	F	48	0.5	6.0	0	0
8	173	50	0.97	N	N	N	N	N	N	N	N	H	1	F	46	0.5	4.5	1	0
9	182	58	0.96	N	N	N	N	N	N	N	N	I	1	F	52	0.5	6.0	0	0
10	191	72	1.03	N	N	N	N	N	N	N	N	J	1	F	53	0.5	5.3	1	1
11	168	53	1.12	N	N	N	N	N	N	N	N	K	1	F	40	0.5	3.8	0	0
12	192	75	1.06	N	N	N	N	N	N	N	N	L	1	F	45	0.5	5.0	1	1
13	195	75	1.01	N	N	N	N	N	N	N	N	M	1	F	34	0.5	4.2	0	0
14	143	26	0.89	N	N	N	N	N	N	N	N	N	1	F	34	0.5	5.0	1	0
15	174	58	1.10	N	N	N	N	N	N	N	N	N	1	F	51	0.5	3.8	1	0
16	184	65	1.04	N	N	N	N	N	N	N	N	N	1	F	48	0.5	5.0	1	0
17	204	86	1.01	N	N	N	N	N	N	N	N	N	1	F	53	0.5	5.3	1	1
18	202	80	0.97	N	N	N	N	N	N	N	N	N	1	F	46	0.5	5.9	0	0
19	185	64	1.01	N	N	N	N	N	N	N	N	N	1	F	45	0.5	4.3	1	1
20	191	64	0.92	N	N	N	N	N	N	N	N	N	1	F	49	0.5	5.3	1	0
21	202	84	1.02	N	N	N	N	N	N	N	N	N	1	F	47	0.5	5.3	1	0
22	220	107	1.00	N	N	N	N	N	N	N	N	N	1	F	50	0.5	5.4	0	0
23	191	69	0.99	N	N	N	N	N	N	N	N	N	1	F	48	0.5	5.3	0	0
24	151	34	0.99	N	N	N	N	N	N	N	N	N	1	F	45	0.5	4.0	1	1
25	188	68	1.02	N	N	N	N	N	N	N	N	N	1	F	52	0.5	5.9	1	0
26	185	64	1.01	N	N	N	N	N	N	N	N	N	1	F	52	0.5	5.8	1	1
27	205	85	0.99	N	N	N	N	N	N	N	N	N	1	F	46	0.5	4.8	1	1
28	184	68	1.09	N	N	N	N	N	N	N	N	N	1	F	53	0.5	5.7	0	0
29	191	67	0.96	N	N	N	N	N	N	N	N	N	1	F	50	0.5	5.5	1	0
30	118	20	1.22	N	N	N	N	N	N	N	N	N	1	F	55	1.0	4.0	1	1
31	188	64	0.96	N	N	N	N	N	N	N	N	N	1	F	64	0.5	5.4	1	1
32	206	76	0.87	N	N	N	N	N	N	N	N	N	1	F	48	0.5	5.7	0	0
33	201	80	0.99	N	N	N	N	N	N	N	N	N	1	F	51	0.5	5.5	1	0
34	207	93	1.05	N	N	N	N	N	N	N	N	N	1	F	50	0.5	5.0	0	0
35	197	72	0.94	N	N	N	N	N	N	N	N	N	1	F	51	0.5	5.0	1	1
36	191	59	0.85	N	N	N	N	N	N	N	N	N	1	F	55	1.0	4.0	1	1
37	180	55	0.94	N	N	N	N	N	N	N	N	N	1	F	47	0.5	4.0	1	1
38	191	63	0.90	N	N	N	N	N	N	N	N	N	1	F	64	0.5	5.4	1	1
39	185	59	0.93	N	N	N	N	N	N	N	N	N	1	F	59	0.5	5.5	1	1
40	191	66	0.95	N	N	N	N	N	N	N	N	N	1	F	52	0.5	5.0	1	1
41	163	45	1.04	N	N	N	N	N	N	N	N	N	1	F	49	0.5	4.0	1	1
42	192	64	0.90	N	N	N	N	N	N	N	N	N	1	F	52	1.0	4.4	1	1
43	200	77	0.96	N	N	N	N	N	N	N	N	N	1	F	49	0.5	3.8	1	1
44	172	49	0.96	N	N	N	N	N	N	N	N	N	1	F	53	1.0	4.0	1	1
45	186	60	0.93	N	N	N	N	N	N	N	N	N	1	F	50	1.0	4.3	1	1
46	180	58	0.99	N	N	N	N	N	N	N	N	N	1	F	52	1.0	4.4	1	1
47	196	73	0.97	N	N	N	N	N	N	N	N	N	1	F	49	0.5	5.2	1	1
48	200	72	0.90	N	N	N	N	N	N	N	N	N	1	F	51	0.5	5.0	1	1
49	180	57	0.98	N	N	N	N	N	N	N	N	N	1	F	49	0.5	4.2	1	1
50	203	74	0.88	N	N	N	N	N	N	N	N	N	1	F	54	0.5	5.0	1	1
51	204	84	0.92	N	N	N	N	N	N	N	N	N	1	F	47	1.0	4.8	1	1
52	187	62	0.95	N	N	N	N	N	N	N	N	N	1	F	54	0.5	4.2	1	1
53	203	81	0.97	N	N	N	N	N	N	N	N	N	1	F	54	0.5	5.0	1	1
54	186	60	0.95	N	N	N	N	N	N	N	N	N	1	F	53	0.5	5.0	1	1
55	175	66	1.23	N	N	N	N	N	N	N	N	N	1	F	54	0.5	4.2	1	1
56	189	65	0.95	N	N	N	N	N	N	N	N	N	1	F	54	0.5	5.0	1	1
57	186	61	0.95	N	N	N	N	N	N	N	N	N	1	F	54	0.5	5.0	1	1
58	188	61	0.92	N	N	N	N	N	N	N	N	N	1	F	53	0.5	5.0	1	1
59	182	60	1.00	N	N	N	N	N	N	N	N	N	1	F	53	0.5	5.P	1	1
60	203	77	0.92	N	N	N	N	N	N	N	N	N	1	F	53	0.5	5.0	1	1

#### SUMMARY OF FISH AUTOPSY

### LOCATION

DWORSHAK NFH

SHAI CONTROL INSPECT NO : NA

Species: STT Autopsy Date: 4-90 Sample Size: 60  
 Strain: 6 Age: 1 YR Tissue Collection No.: NA  
 Mark/Lot: STT-NFW-89-DW0-2 Disease Survey No.: NA  
 Unit: F. 32,36,38-SYS II Water Temp.: 55 F Case History No.: NA  
 Fish Source: NORTH FORK Water Hardness: 10 ppm Custody No.: NA  
 Egg Source: DWORSHAK Investigator: K.CLEMENS  
 Hatching Date: NA Reason for Autopsy: PRE-RELEASE  
 Remarks: 30 FISH ON 4-12, 30 FISH ON 4-30

	MEAN	STANDARD DEVIATION	COEFFICIENT OF VARIATION
Length	175.350 mm	28.9 mm	16%
Weight	60.330 gr	24.91 gr	41%
Kt/l	1.120	0.07	6%
Ct/l	4.046		
Hematocrit	46.380	4.8	10%
Leucocrit	8.680	0.33	4%
Plasma Protein	5.260	1.03	20%

\*Expressed as KtL times 10 to the fifth power

<sup>†</sup>Converted from Kt1; expressed as Ct1 times 10 to the fourth power

VALUES AS PERCENT OF TOTAL SAMPLE

### Spears of Normans

95% 97% 97% 100% XXXXXXXX 94% 100% 100% 98% XXXXXXXX 7% 4%

### Summary of Means

For example, the following table shows the results of a study comparing the effectiveness of two different treatments for depression.

SE<sub>3</sub>: H: C23 E: 49° W: 0°

**GENERAL REMARKS**

GENERAL REMARKS

SKIN - LT TO MOD EPITHELIOS AMBIPHYRA - LT GYPO

CONARD'S THIRTYURE

OTHERS SS E ON 4-12 AZ E ON 4-30

SN	IGH	WGT	Eti	EYE	GILL	PSBR	THY	FAT	SPL	GUT	KID	LIV	BILE	SEX	HEM	LEU	PLFF	FIN	OPCL	Qual. Control No.	NA
1	95	9	1.05	N	N	N	N	N	B	0	N	A	I	M	45	0.5	5.0	0	1	2	2
2	167	66	1.01	N	N	N	N	N	B	0	N	A	I	M	42	0.5	4.6	1	1	1	1
3	162	47	1.11	N	N	N	N	N	B	0	N	A	I	M	40	0.5	4.3	1	1	1	1
4	156	38	1.00	E2	N	N	N	N	B	0	N	A	I	M	37	0.5	5.0	1	1	1	1
5	133	27	1.15	E2	N	N	N	N	B	0	N	A	I	M	51	1.0	5.8	1	1	1	1
6	160	44	1.07	N	N	N	N	N	B	0	N	A	I	M	42	0.5	4.2	1	1	1	1
7	171	55	1.10	N	N	N	N	N	B	0	N	A	I	M	37	0.5	5.5	1	1	1	1
8	211	100	1.06	N	N	N	N	N	B	0	N	A	I	M	40	0.5	5.0	1	1	1	1
9	188	76	1.14	N	N	N	N	N	B	0	N	A	I	M	47	0.5	5.5	1	1	1	1
10	144	37	1.24	E1	N	N	N	N	B	0	N	A	I	M	45	0.5	5.5	1	1	1	1
11	152	38	1.08	E1	N	N	N	N	B	0	N	A	I	M	54	0.5	5.5	1	1	1	1
12	223	89	0.80	N	N	N	N	N	B	0	N	A	I	M	50	0.5	5.5	1	1	1	1
13	178	64	1.13	N	N	N	N	N	B	0	N	A	I	M	52	0.5	5.5	1	1	1	1
14	198	83	1.07	E1	N	N	N	N	B	0	N	A	I	M	52	0.5	5.5	1	1	1	1
15	176	26	1.03	E1	N	N	N	N	B	0	N	A	I	M	50	0.5	5.5	1	1	1	1
16	188	68	1.02	N	N	N	N	N	B	0	N	A	I	M	54	0.5	5.5	1	1	1	1
17	179	40	1.05	N	N	N	N	N	B	0	N	A	I	M	46	0.5	5.5	1	1	1	1
18	176	55	1.01	N	N	N	N	N	B	0	N	A	I	M	54	0.5	5.5	1	1	1	1
19	139	29	1.08	N	N	N	N	N	B	0	N	A	I	M	44	0.5	5.5	1	1	1	1
20	145	33	1.08	N	N	N	N	N	B	0	N	A	I	M	50	0.5	5.5	1	1	1	1
21	148	31	0.96	N	N	N	N	N	B	0	N	A	I	M	52	0.5	5.5	1	1	1	1
22	178	63	1.12	N	N	N	N	N	B	0	N	A	I	M	52	0.5	5.5	1	1	1	1
23	190	68	0.99	N	N	N	N	N	B	0	N	A	I	M	52	0.5	5.5	1	1	1	1
24	160	49	1.02	N	N	N	N	N	B	0	N	A	I	M	44	0.5	5.5	1	1	1	1
25	123	21	1.13	N	N	N	N	N	B	0	N	A	I	M	50	0.5	5.5	1	1	1	1
26	185	68	1.07	N	N	N	N	N	B	0	N	A	I	M	52	0.5	5.5	1	1	1	1
27	202	89	1.08	N	N	N	N	N	B	0	N	A	I	M	52	0.5	5.5	1	1	1	1
28	218	109	1.05	N	N	N	N	N	B	0	N	A	I	M	52	0.5	5.5	1	1	1	1
29	200	82	1.03	N	N	N	N	N	B	0	N	A	I	M	52	0.5	5.5	1	1	1	1
30	106	10	0.84	N	N	N	N	N	B	0	N	A	I	M	52	0.5	5.5	1	1	1	1
31	175	60	1.12	N	N	N	N	N	B	0	N	A	I	M	52	0.5	5.5	1	1	1	1
32	208	88	0.98	N	N	N	N	N	B	0	N	A	I	M	52	0.5	5.5	1	1	1	1
33	205	94	1.09	N	N	N	N	N	B	0	N	A	I	M	52	0.5	5.5	1	1	1	1
34	194	76	0.96	N	N	N	N	N	B	0	N	A	I	M	52	0.5	5.5	1	1	1	1
35	182	61	1.01	N	N	N	N	N	B	0	N	A	I	M	52	0.5	5.5	1	1	1	1
36	201	83	1.02	N	N	N	N	N	B	0	N	A	I	M	52	0.5	5.5	1	1	1	1
37	198	87	1.12	N	N	N	N	N	B	0	N	A	I	M	52	0.5	5.5	1	1	1	1
38	197	79	1.03	N	N	N	N	N	B	0	N	A	I	M	52	0.5	5.5	1	1	1	1
39	182	59	0.98	N	N	N	N	N	B	0	N	A	I	M	52	0.5	5.5	1	1	1	1
40	185	72	1.14	N	N	N	N	N	B	0	N	A	I	M	52	0.5	5.5	1	1	1	1
41	204	92	1.05	N	N	N	N	N	B	0	N	A	I	M	52	0.5	5.5	1	1	1	1
42	189	74	1.10	N	N	N	N	N	B	0	N	A	I	M	52	0.5	5.5	1	1	1	1
43	155	57	0.99	N	N	N	N	N	B	0	N	A	I	M	52	0.5	5.5	1	1	1	1
44	182	62	1.03	N	N	N	N	N	B	0	N	A	I	M	52	0.5	5.5	1	1	1	1
45	168	53	1.12	N	N	N	N	N	B	0	N	A	I	M	52	0.5	5.5	1	1	1	1
46	221	104	0.96	N	N	N	N	N	B	0	N	A	I	M	52	0.5	5.5	1	1	1	1
47	182	65	1.03	N	N	N	N	N	B	0	N	A	I	M	52	0.5	5.5	1	1	1	1
48	211	96	1.02	N	N	N	N	N	B	0	N	A	I	M	52	0.5	5.5	1	1	1	1
49	165	46	1.02	N	N	N	N	N	B	0	N	A	I	M	52	0.5	5.5	1	1	1	1
50	135	25	1.02	N	N	N	N	N	B	0	N	A	I	M	52	0.5	5.5	1	1	1	1
51	152	39	1.11	N	N	N	N	N	B	0	N	A	I	M	52	0.5	5.5	1	1	1	1
52	152	36	1.03	N	N	N	N	N	B	0	N	A	I	M	52	0.5	5.5	1	1	1	1
53	215	97	0.98	N	N	N	N	N	B	0	N	A	I	M	52	0.5	5.5	1	1	1	1
54	191	69	0.99	N	N	N	N	N	B	0	N	A	I	M	52	0.5	5.5	1	1	1	1
55	182	63	1.05	N	N	N	N	N	B	0	N	A	I	M	52	0.5	5.5	1	1	1	1
56	188	66	0.99	N	N	N	N	N	B	0	N	A	I	M	52	0.5	5.5	1	1	1	1
57	212	96	1.01	N	N	N	N	N	B	0	N	A	I	M	52	0.5	5.5	1	1	1	1
58	176	54	0.99	N	N	N	N	N	B	0	N	A	I	M	52	0.5	5.5	1	1	1	1
59	135	27	1.10	N	N	N	N	N	B	0	N	A	I	M	52	0.5	5.5	1	1	1	1
60	132	26	1.13	N	N	N	N	N	B	0	N	A	I	M	52	0.5	5.5	1	1	1	1

SUMMARY OF FISH AUTOPSY

LOCATION: DWORSHAK NFH

QUAL. CONTROL INSPECT. NO.:

Species: STT      Autopsy Date: 4-90      Sample Size: 60  
 Strain: B      Age: 1 YR      Tissue Collection No.:  
 Mark/Lot: STT-NFW-89-DW0-3      Disease Survey No.:  
 Unit: R. 81.53 SY92Z      Water Temp.: 46 F      Case History No.:  
 Fish Source: NORTH FORK Water Hardness: 10 ppm      Custody No.:  
 Egg Source: DWORSHAK Investigator: K. CLEMENS  
 Hatching Date: Reason for Autopsy: PRE-RELEASE  
 Remarks: 30 FISH ON 4-12, 30 FISH ON 4-30

	MEAN	STANDARD DEVIATION	COEFFICIENT OF VARIATION
Length	207.880 mm	22.66 mm	11%
Weight	91.600 gr	27.5 gr	30%
Ktj	1.020	0.07	7%
Ctl**	3.685		
Hematocrit	49.870	4.61	9%
Leucocrit	0.550	0.15	27%
Plasma Protein	5.290	0.81	15%

\*Expressed as Ktj times 10 to the fifth power

\*\*Converted from Ktj; expressed as Ctl times 10 to the fourth power

VALUES AS PERCENT OF TOTAL SAMPLE

	PSEUDO-	MESEN.	HIND								
EYES	GILLS	BRANCHES	THYMUS	FAT	SPLEEN	GUT	KIDNEY	LIVER	BILE	FIN	
N	100%	N	100%	0	2%	B	98%	0	100%	A	42%
B1	0%	F	0%	S	0%	R	0%	1	0%	S	55%
B2	0%	C	0%	L	0%	2	52%	G	0%	B	38%
E1	0%	M	0%	S&L	0%	0.0	22%	NO	0%	C	7%
E2	0%	P	0%	I	0%	4	0%	E	2%	M	0%
H1	0%	OT	0%	OT	0%	x	1.9	OT	0%	F	0%
H2	0%								OT	OT	0%
M1	0%										
M2	0%										
OT	0%										

Summary of Normals

100%	100%	100%	100%	xxxxxx	98%	100%	100%	93%	xxxxxx	15%	83%
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Summary of Means

xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx	0.0	1.9	xxxxxx	0.0	xxxxxx	0.5	0.8	0.1
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SEX: M: 52% F: 48% U: 0%

GENERAL REMARKS

FINS 100 % DORSAL EROSION, 5 % PECTORAL EROSION

SKIN LT TO MOD EPISTYLIS, AMBIPHRYRA, LT GYRO

GONADS 3/60 MATURE

OTHER 46 F UN 4-12; 46 F UN 4-30

## Qual. Control No

SN	LGH	WT	ATL	EYE	GILL	PSBR	TRY	FAT	SPI	GUT	KLD	LIV	BILE	SEX	HEM	LEU	PLPE	FIN	OPCL
1	194	74	1.01	N	N	N	N	0	1	B	1	F	48	0.5	4.1	1	0	0	
2	178	59	1.05	N	N	N	N	0	2	B	1	F	51	0.5	4.8	1	1	1	
3	202	89	0.97	N	N	N	N	0	2	B	1	F	51	0.5	5.5	1	1	1	
4	209	100	1.10	N	N	N	N	0	2	B	1	M	44	0.5	6.2	1	1	1	
5	168	54	1.14	N	N	N	N	0	2	B	1	M	64	0.5	7.8	1	1	1	
6	174	56	1.06	N	N	N	N	0	2	B	1	M	50	0.5	6.0	1	1	1	
7	221	103	0.95	N	N	N	N	0	2	B	1	M	52	1.0	4.8	1	1	1	
8	196	82	1.09	N	N	N	N	0	2	B	1	M	51	0.5	5.1	1	1	1	
9	208	102	1.13	N	N	N	N	0	2	B	1	M	55	0.5	5.6	1	1	1	
10	190	63	0.92	N	N	N	N	0	2	B	1	M	60	0.5	7.1	0	0	0	
11	178	63	1.12	N	N	N	N	0	2	B	1	M	50	0.5	5.7	1	1	1	
12	187	70	1.07	N	N	N	N	0	2	B	1	M	49	0.5	5.0	1	1	1	
13	183	65	1.06	N	N	N	N	0	2	B	1	M	47	0.5	4.5	1	1	1	
14	186	68	1.06	N	N	N	N	0	2	B	1	M	48	0.5	4.8	1	1	1	
15	185	67	1.06	N	N	N	N	0	2	B	1	M	50	0.5	5.3	1	1	1	
16	225	109	0.96	N	N	N	N	0	2	B	1	M	52	0.5	5.0	1	1	1	
17	196	87	1.16	N	N	N	N	0	2	B	1	M	48	0.5	6.1	0	0	0	
18	225	112	0.98	N	N	N	N	0	2	B	1	M	50	0.5	6.1	1	1	1	
19	242	145	1.02	N	N	N	N	0	2	B	1	M	51	1.0	6.0	1	1	1	
20	247	127	0.84	N	N	N	N	0	2	B	1	M	57	0.5	6.0	1	1	1	
21	221	95	0.88	N	N	N	N	0	2	B	1	M	48	0.5	6.0	1	1	1	
22	192	71	1.00	N	N	N	N	0	2	B	1	M	60	0.5	7.0	1	1	1	
23	215	99	1.00	N	N	N	N	0	2	B	1	M	49	0.5	5.4	0	0	0	
24	209	99	1.07	N	N	N	N	0	2	B	1	M	52	0.5	5.0	1	1	1	
25	246	140	0.94	N	N	N	N	0	2	B	1	M	57	0.5	6.0	1	1	1	
26	240	129	0.93	N	N	N	N	0	2	B	1	M	49	0.5	5.2	1	1	1	
27	213	90	0.93	N	N	N	N	0	2	B	1	M	51	0.5	5.0	1	1	1	
28	232	139	1.11	N	N	N	N	0	2	B	1	M	49	0.5	5.4	1	1	1	
29	181	58	0.98	N	N	N	N	0	2	B	1	M	56	0.5	6.0	1	1	1	
30	250	159	1.02	N	N	N	N	0	2	B	1	M	44	1.0	4.2	0	0	0	
31	190	60	0.87	N	N	N	N	0	2	B	1	M	45	0.5	5.2	0	0	0	
32	198	79	1.02	N	N	N	N	0	2	B	1	M	44	0.5	4.0	0	0	0	
33	170	46	0.94	N	N	N	N	0	2	B	1	M	47	1.0	5.8	1	1	1	
34	211	92	0.98	N	N	N	N	0	2	B	1	M	51	0.5	6.0	1	1	1	
35	214	94	0.98	N	N	N	N	0	2	B	1	M	46	0.5	5.8	1	1	1	
36	197	77	1.01	N	N	N	N	0	2	B	1	M	55	0.5	5.5	1	1	1	
37	205	80	0.93	N	N	N	N	0	2	B	1	M	55	0.5	5.0	1	1	1	
38	190	68	0.99	N	N	N	N	0	2	B	1	M	51	0.5	6.2	1	1	1	
39	201	85	1.05	N	N	N	N	0	2	B	1	M	50	0.5	5.6	1	1	1	
40	158	42	1.06	N	N	N	N	0	2	B	1	M	52	0.5	3.8	1	1	1	
41	211	89	0.95	N	N	N	N	0	2	B	1	M	46	0.5	5.2	1	1	1	
42	198	68	0.88	N	N	N	N	0	2	B	1	M	47	0.5	4.0	1	1	1	
43	196	69	0.92	N	N	N	N	0	2	B	1	M	45	0.5	5.4	1	1	1	
44	216	113	1.12	N	N	N	N	0	2	B	1	M	47	0.5	6.0	1	1	1	
45	172	57	1.12	N	N	N	N	0	2	B	1	M	45	0.5	4.5	1	1	1	
46	215	92	0.93	N	N	N	N	0	2	B	1	M	42	0.5	5.0	1	1	1	
47	252	144	1.01	N	N	N	N	0	2	B	1	M	45	0.5	4.0	1	1	1	
48	210	96	1.04	N	N	N	N	0	2	B	1	M	49	1.0	5.4	1	1	1	
49	245	103	0.95	N	N	N	N	0	2	B	1	M	45	1.0	5.2	0	0	0	
50	195	72	0.97	N	N	N	N	0	2	B	1	M	51	0.5	5.1	1	1	1	
51	212	92	0.97	N	N	N	N	0	2	B	1	M	45	1.0	5.2	1	1	1	
52	244	142	0.98	N	N	N	N	0	2	B	1	M	46	0.5	4.8	1	1	1	
53	258	130	0.96	N	N	N	N	0	2	B	1	M	48	0.5	3.8	1	1	1	
54	201	78	0.96	N	N	N	N	0	2	B	1	M	49	0.5	4.2	1	1	1	
55	223	104	0.94	N	N	N	N	0	2	B	1	M	49	0.5	4.2	1	1	1	
56	222	107	0.98	N	N	N	N	0	2	B	1	M	50	0.5	4.5	1	1	1	
57	226	110	0.95	N	N	N	N	0	2	B	1	M	41	0.5	4.5	0	0	0	
58	227	111	0.95	N	N	N	N	0	2	B	1	M	49	0.5	4.2	1	1	1	
59	215	94	0.95	N	N	N	N	0	2	B	1	M	50	0.5	4.2	1	1	1	
60	228	106	0.89	N	N	N	N	0	2	B	1	M	41	0.5	4.5	0	0	0	

TABLE 3.

PM-RELEASE ORGANOSOMATIC INDICES DATA

Tule Fall Chinook Salmon

Spring Creek National Fish Hatchery

Underwood, Washington

Spring 1990

Pond 9 March 15, 1990 release

Fish No.	Ln. mm	Wt. gms	e	g	p	t	f	s	i	k	l	m	h	s	o	Remarks
			y	i	s	h	a	p	n	i	e	e	p	p	r	
			s	l	r	m	n	n	n	r	n	a	0	0	r	
1	82	52.0	N	0	0	0	1	0	0	0	0	0	47.0	4.3	0	
2	75		N	0	0	0	1	0	0	0	0	0	39.0	4.6	0	ad
3	78		N	0	0	0	2	0	0	0	0	0	36.0	4.4	0	
4	81		N	0	0	0	1	0	0	0	0	0	41.0	5.1	0	
5	79		N	0	0	0	2	0	0	0	0	1	39.0	4.6	0	
6	74		N	0	0	1	2	0	0	0	0	0	42.0	4.8	0	
7	81		N	0	0	0	2	0	0	0	0	0	39.0	4.4	0	
8	76		N	0	0	0	2	0	0	0	0	0	42.0	4.2	0	yellow fat
9	75		N	0	0	0	1	0	0	0	0	0	42.0	4.8	0	
10	63		N	0	0	0	2	0	0	0	0	0	35.0	5.3	0	
11	74		N	0	0	1	1	0	0	0	0	0	42.0	4.7	0	
12	73		N	0	0	0	2	0	0	0	0	0	44.0	4.2	0	ad, yol k sac rem
13	95	43.0	N	0	0	0	1	0	0	0	0	0	41.0	4.1	0	
14	74		N	0	0	0	2	0	0	0	0	0	39.0	4.4	0	yol k sac rem.
15	79		N	0	0	0	1	0	0	0	0	0	42.0	3.8	0	yol k sac rem.
16	76		N	0	0	0	1	0	0	0	0	0	41.0	3.3	0	
17	76		N	0	0	1	2	0	0	0	0	0	41.0	4.0	0	yol k sac rem.
18	68		N	0	0	0	2	0	0	0	0	0	42.0	3.0	0	
19	80		N	0	0	0	2	0	0	0	0	0	41.0	4.2	0	ad
20	72		N	0	0	1	2	0	0	0	0	0	45.0	3.6	0	
21	81		N	0	0	0	2	0	0	0	0	0	43.0	4.5	0	yol k sac rem.
22	69		N	0	0	0	2	0	0	0	0	0	47.0	3.4	0	
23	69		N	0	0	2	2	0	0	0	0	0	43.0	5.0	0	

eyes	= eye	intn	= intestine
gill	□ gill	kidn	= kidney
psbr	= pseudobranch	livr	= liver
thym	= thymus	hema	= hematocrits
fat	= fat (pyroligic caeca)	spro	= serum protein
spln	= spleen	oper	= opercular

	Length	Weight	Hematocrits	Serum Protein
Average	76.52173	4.129130	41.43478	4.291304
Stdv.	4.538430	0.209801	2.766256	0.556711
c of v	0.059309	0.050810	0.068197	0.996638
K Factor	0.0000092			
c.f factor	0.0003329			

Pond 12, March Release Fish, 3/14/90

Fish No.	Ln. mm	Wt. gms	e	g	p	t	f	s	i	k	l	m	h	s	o	Remarks											
			y	i	s	h	a	p	n	i	e	e	p	p	s	l	r	m	n	n	n	r	n	a	0	r	
1	72	43.0	N	0	0	0	2	0	0	0	0	0	36.0	2.9	0												
2	80		N	0	0	0	2	0	0	0	0	0	41.0	4.2	0	ad,	yolk	sac	rem.								
3	79		N	0	0	0	1	0	0	0	0	0	43.0	4.5	0	yolk	sac	spleen	hemm.								
4	71		N	0	0	0	1	0	0	0	0	0	42.0	3.7	0	yolk	sac	anal	vent	inflamed							
5	71		N	0	0	0	2	0	0	0	0	0	39.0	3.3	0												
6	75		N	0	0	0	2	0	0	0	0	0	39.0	2.9	0	yolk	sac										
7	79		N	0	0	0	1	0	0	0	0	0	42.0	2.9	0	Ich	gills										
8	72		N	0	0	1	2	0	0	0	0	0	36.0	3.7	0	yolk	sac										
9	76		N	0	0	0	1	0	0	0	0	0	40.0	4.0	0												
10	68		N	0	0	0	2	0	0	0	0	0	41.0	3.7	0												
11	77		N	0	0	0	2	0	0	0	0	0	40.0	3.4	0												
12	69		N	0	0	0	2	0	0	0	0	0	42.0	4.0	0	yolk	sac										
13	74	41.0	N	0	0	0	2	0	0	0	0	0	41.0	4.0	0	ad											
14	75		N	0	0	0	2	0	0	0	0	0	40.0	5.2	0	yolk	sac										
15	a2		N	0	0	0	1	0	0	0	0	0	36.0	5.2	0												
16	76		N	0	0	0	2	0	0	0	0	0	35.0	4.0	0	ad,	black	spots	spleen								
17	79		N	0	0	0	2	0	0	0	0	0	35.0	4.5	0												
18	66		N	0	0	0	2	5	0	0	0	0	41.0	5.0	0												
19	79		N	0	0	0	2	0	0	0	0	0	43.0	4.2	0												
20	74		1	0	0	0	2	0	0	0	0	0	38.0	4.7	0												
21	72		N	0	0	0	2	0	0	0	0	0	43.0	4.3	0												
22	73		N	0	0	2	2	0	0	0	0	0	40.0	4.0	0												
23	70		N	0	0	0	2	0	0	0	0	0	46.0	4.2	0												

eyes	= eye	ki dn	= kidney
gill	= gill	livr	= liver
psbr	= pseudobranch	mesn	= mesentary
thym	= thymus	hema	= hematocrits
fat	= fat (pyloric caeca)	spro	= serum protein
spin	= spleen	oper	= opercular
intn	= intestine		

	Length	Weight	Hematocrits	Serum Protein
Average	74.30434	<b>3.651739</b>	<b>39.95652</b>	<b>4.021739</b>
St d.v.	4.111857	0.074929	2.820395	0.653390
c of v	0.055338	0.020519	0.070586	0.162464
K Factor	0.0000089			
C Factor	0.0003218			

Pond 13, March Release fish, sampled 3/14/90

Fish No.	Ln. mm	Wt. gms	e	g	p	t	f	s	i	k	l	m	h	s	o
			y	i	s	h	a	.	o	n	i	e	e	P	P
			e	1	b	y	t	1	t	d	v	s	m	r	e
			s	l	r	m	n	n	n	r	n	a	0	r	Remarks
1	72	51.0	N	0	0	0	2	0	0	0	0	0	39.0	5.3	0
2	76		N	0	0	110	0	0	0	0	0	0	42.0	4.4	0
3	74		N	0	0	0	2	0	0	0	0	0	39.0	3.8	0 ad
4	77		N	0	1	1	1	0	0	0	0	0	42.0	5.1	0
5	70		N	0	0	0	2	0	0	0	0	0	37.0	4.0	0
6	81		N	0	0	1	2	0	0	0	0	0	42.0	4.5	0 yolk sac t-em.
7	83		N	0	0	0	1	0	0	0	0	0	44.0	5.8	0
8	76		N	0	0	0	2	0	0	0	0	0	38.0	4.0	0 ad
9	81		N	0	0	1	2	0	0	0	0	0	43.0	5.2	0
10	75		N	0	0	0	100	00	0	0	0	0	46.0	4.6	0 yolk sac rem.
11	78		N	0	0	1	2	0	0	0	0	0	44.0	5.5	0
12	84		N	0	0	1	2	0	0	0	0	0	43.0	6.0	0 Spleen hemm.
13	73	44.0	N	0	0	1	2	0	0	0	0	0	38.0	5.0	0
14	79		N	0	0	0	2	0	0	0	0	0	3'3.0	4.9	0
15	76		N	0	0	0	2	0	0	0	0	0	38.0	4.5	0
16	76		N	0	0	0	2	0	0	0	0	0	37.0	5.3	0 yolk sac rem., lt pink sple
17	77		N	0	1	1	1	0	0	0	0	0	40.0	1.7	0 Gaseous material in Kidney
18	75		N	5	0	0	2	0	0	0	0	0	40.0	4.8	0
19	72		N	0	0	0	1	0	0	0	0	0	38.0	5.0	0
20	79		N	0	0	0	2	0	0	0	0	0	41.0	5.5	0
21	74		N	0	0	1	1	0	0	0	0	0	39.0	3.6	0
22	78		N	0	0	0	2	0	0	0	0	0	38.0	4.5	0 Black spots spleen
23	74		N	0	0	0	2	0	0	0	0	0	38.0	4.0	0 ad

eyes	= eye	kidn	= kidney
gill	= gill	livr	= liver
psbr	= pseudobranch	mesn	= mesentary
thym	= thymus	hema	= hematocrits
fat	= fat (pyloric caeca)	spro	= serum protein
spln	= spleen	oper	= opercular
intn	= intestine		

	Length	Weight	Hematocrits	Serum Protein
Average	76.52173	4.130435	40.17391	4.652173
Stdv.	3.462464	0.124882	2.530718	0.889489
c of v	0.045248	0.030235	0.062994	0.191198
K Factor	0.0000092			
C Factor	0.0003330			

Pond 15, March Release Fish, 3/15/90

Fish No.	Ln. mm	Wt. gms	e y s i s h a p n i e s l r m n n n r n	p i s h a p n i e l b y t l t d v s m r a 0	t a p n i e t o n n n r n a 0	f s i k l m h e D r e r	s D r e r	o D e r	Remarks	
1	80	49.0	N 0 0 0 3 0 0 0 0 0	0	42.0	4.6	0			
2	77		N 0 0 0 1 0 0 0 0 0	0	42.0	4.6	0	yolk sac rem., yellow fat		
4	77		N 0 0 0 1 0 0 0 0 0	0	45.0	3.8	0	Black spots spleen		
5	74 71		N 0 0 0 2 0 0 0 0 0	0	41.0	3.8	0			
			N 0 0 0 2 0 0 0 0 0	0	48.0	3.8	0	2 black spots spleen, hemm.		
6	<b>81</b>		N 0 0 0 2 0 0 0 0 0	0	39.0	3.9	0			
7	75		N 0 0 0 3 0 0 0 0 0	0	45.0	3.9	0	yolk sac rem., It pink spleen		
8	67		N 0 0 0 2 0 0 0 0 0	0	37.1	4.3	0			
9	a2		N 0 1 1 2 0 0 0 0 0	0	40.0	4.4	0			
10	<b>81</b>		N 0 0 1 2 4 0 0 0 0	0	42.0	4.5	0			
11	<b>76</b>		N 0 0 0 2 0 0 0 0 0	0	40.0	6.9	0			
12	75		N 0 0 0 1 0 0 0 0 0	0	37.0	4.5	0	Black spots spleen		
13	75	46.0	<b>N 0 1 1 1 0 0 0 0 0</b>	0	35.0	4.3	0	Black spots spleen		
14	a2		N 0 2 3.10 0 0 0 0 0	0	39.0	4.5	0	yolk sac rem.		
15	74		N 0 0 0 2 0 0 0 0 0	0	41.0	3.8	0			
16	a2		N 0 0 0 2 0 0 0 0 0	0	32.0	4.5	0	yolk sac rem.		
17	75		<b>N 0 0 1 1 0 0 0 0 0</b>	0	38.0	4.6	0			
18	76		N 0 0 0 2 0 0 0 0 0	0	41.0	5.2	0			
19	<b>72</b>		<b>N 0 1 0 1 0 0 0 0 0</b>	0	38.0	4.6	0	yolk sac rem.		
20	<b>81</b>		N 0 1 1 1 0 0 0 0 0	0	40.0	4.6	0			
21	78		N 0 0 0 1 0 0 0 0 0	0	47.0	5.0	0	Ich gills, caseous kidney		
22	81		N 0 0 0 2 0 0 0 0 0	0	45.0	4.3	0			
23	74		N 0 0 0 2 0 0 0 0 1	0	41.0	4.3	0	ad, yolk sac rem.		

eyes	= eye	kidn	= kidney
gill	= gill	livr	= liver
psbr	= pseudobranch	mesn	= mesentary
thym	= thymus	hema	= hematocrits
fat	= fat (pyloric caeca)	spro	= serum protein
<b>sp1n</b>	= spleen	oper	= opercular
intn	= intestine		

	Lenght	Weight	Hematocrits	Serum Protein
Average	76.78260	4.127826	40.65652	4.465217
St dev.	3.922693	0.049953	3.674214	0.638346
c of	<b>0.051088</b>	0.012102	0.090372	0.142959
K Factor	0.0000091			
C Factor	0.0003294			

Pond 16, March Release Fish Sampled 3/14/90

Fish No.	Ln. mm	Wt. gms	e y e s l <b>1</b>	g i b r <b>1</b> <b>r</b> <b>m</b>	p s h y t <b>n</b> <b>n</b> <b>n</b> <b>r</b> <b>n</b>	t a p y l <b>n</b> <b>n</b> <b>n</b> <b>r</b> <b>n</b>	f l a t l <b>d</b> <b>v</b> <b>s</b> <b>m</b>	s i n n n <b>r</b> <b>n</b>	i e e e e <b>a</b>	k i e e e <b>a</b>	l e e e e <b>0</b>	m r e r <b>0</b>	h r e r <b>r</b>	s p p e <b>0</b>	Remarks		
1	76	41.0	N	0	0	1	1	0	0	0	0	44.0	5.9	0	yolk	sac	(sm. yellow piece)
2	70		N	0	0	1	2	0	0	0	0	42.0	4.8	0	yolk	sac	rem.
3	73		N	0	0	2	2	0	0	0	0	42.0	5.5	0			
4	79		N	0	0	0	2	0	0	0	0	43.0	3.5	0			
5	77		N	0	0	0	1	0	0	0	0	45.0	6.1	0	yolk	sac	rem.
6	70		N	0	0	1	2	0	0	0	0	44.0	4.5	0			
7	69		N	0	0	0	2	0	0	0	0	43.0	4.2	0	ad		
8	65		N	0	0	0	2	0	0	0	0	43.0	2.8	0	Anal inflamed,		
9	69		<b>N</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	43.0	4.1	0	yolk	sac	rem.
10	77		N	0	0	0	2	0	0	0	0	45.0	6.3	0	Yellow	fat	
11	65		<b>N</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	49.0	3.6	0			
12	74		N	0	0	0	3	0	0	0	0	42.0	5.0	0	Spleen	hemm.	
13	<b>77</b>	<b>42.0</b>	<b>N</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	38.0	4.3	0			
14	77		N	0	0	1	2	0	0	0	0	44.0	5.0	0	ad,	yolk	sac
15	78		N	0	0	0	2	0	0	0	0	43.0	5.1	0			
16	65		N	0	0	0	3	0	0	0	0	41.0	5.0	0			
17	76		N	0	0	1	2	0	0	0	1	40.0	4.5	0	Anal	inflamed	
18	<b>74</b>		N	0	0	0	3	0	0	0	0	42.0	3.8	0	Black	<b>spots/lt</b>	pink spleen
19	73		N	0	0	0	2	0	0	0	0	39.0	4.4	0	ad		
20	75		N	0	0	0	1	0	0	0	0	41.0	5.2	0	yolk	sac	black spots spleen
21	70		N	0	0	0	1	0	0	0	0	44.0	4.2	0	yolk	sac	
22	76		N	0	0	0	1	0	0	0	0	44.0	5.4	0			
23	74		N	0	0	0	2	0	0	0	0	38.0	5.2	0			

eyes	= eye	ki dn	= kidney
gill	= gill	livr	= liver
psbr	= pseudobranch	mesn	= mesentary
thym	= thymus	hema	= hematocrits
fat	= fat (pyloric caeca)	spro	= serum protein
spln	= spleen	oper	= opercular
intn	= intestine		

	Length	Weight	Hematocrits	Serum Protein
Average	73	3.611304	42.56521	4.713043
Stdv.	4.222095	0.199811	2.392489	0.841481
c of v	0.057836	0.055330	0.056207	0.178543
K Factor	0.0000093			
C Factor	0.0003354			

POND 17. MARCH 16. 1990 RELEASE, SPRING CREEK NFH DIET STUDY  
 QUIET ANSWERABILITY

I SH NO	LN. mm	WT. gm	e g p t f s i k l m h y i s h a p n i e e e l b y t l t d v s m s l r m n n n r n a	s o P P r e 0 r	Remarks
1	79	49	N 0 0 0 2 0 0 0 0 0 35.0 5.2 0		black spots spleen
2	70		N 0 0 0 2 0 0 0 0 0 38.0 4.5 0		
3	72		N 0 0 0 2 0 0 0 0 0 38.0 4.7 0		
4	77		N 0 0 0 2 0 0 0 0 0 35.0 5.0 0		
5	78		N 0 0 0 2 0 0 0 0 1 40.0 5.0 0		
6	76		<b>N 0 0 0 1 0 0 0 0 0</b> 35.0 4.9 0		yolk sac rem.
7	80		N 0 0 0 1 0 0 0 0 0 39.0 5.9 0		yolk sac rem.
8	76		N 0 0 0 1 0 0 0 0 0 40.0 4.0 0		
9	75		N 0 0 1 2 0 0 0 0 0 37.0 4.5 0		
10	79		<b>N 0 0 1 1 0 0 0 0 0</b> 41.0 6.1 0		Ich on gills
11	75		N 0 0 1 2 0 0 0 0 0 40.0 3.5 0		
12	75		N 0 0 0 1 0 0 0 0 0 41.0 4.4 0		
13	77	51	N 0 1 1 2 0 0 0 0 0 38.0 5.1 0		
14	79		<b>N 0 0 0 1 0 0 0 0 0</b> 35.0 4.5 0		
15	83		<b>N 0 1 1 1 0 0 0 0 0</b> 38.0 4.5 0		yolk sac rem.
16	76		<b>N 0 0 0 2 0 1 0 0 0</b> 39.0 4.6 0		ad
17	73		N 0 0 0 1 1 0 0 0 0 39.0 3.0 0		
18	76		N 0 0 1 2 0 0 0 0 0 37.0 5.0 0		
19	78		<b>N 0 0 0 1 0 0 0 0 0</b> 39.0 4.9 0		
20	83		N 0 1 0 2 0 0 0 0 0 40.0 4.0 0		Ich on gills
21	76		<b>N 0 1 1 2 0 0 0 0 0</b> 38.0 5.5 0		
22	80		<b>N 0 0 0 1 0 0 0 0 0</b> 33.0 5.0 0		yolk sac rem.
23	84		<b>N 0 0 0 2 0 0 0 0 0</b> 40.0 4.5 0		yolk sac rem.
24	75		<b>N 0 0 0 2 0 0 0 0 1</b> 43.0 6.6 0		
25	76	50	N 0 0 0 1 0 0 0 0 0 37.0 5.0 0		
26	82		N 0 0 0 2 0 0 0 0 0 34.0 4.9 0		
27	75		N 0 0 0 2 0 1 0 0 0 35.5 4.8 0		
28	74		N 0 0 0 2 0 0 0 0 0 36.0 4.1 0		yolk sac rem.
29	84		N 0 0 0 1 0 0 0 0 0 41.0 5.8 0		
30	80		N 0 0 0 2 0 0 0 0 0 40.0 5.5 0		yolk sac rem.
31	77		N 0 0 0 2 0 0 0 0 0 36.0 5.0 0		
32	76		N 0 0 0 1 0 0 0 0 0 40.0 4.9 0		ad
33	74		N 0 0 1 2 0 0 0 0 0 35.0 3.5 0		yolk sac rem.
34	74		N 0 0 1 2 0 0 0 0 0 41.5 4.6 0		
35	82		N 0 0 0 1 0 0 0 0 0 39.0 4.5 0		yolk sac rem.
36	78		N 0 0 1 2 0 0 0 0 0 35.0 5.1 0		yolk sac rem.
37	84	60	N 0 0 1 1 0 0 0 0 0 38.0 4.1 0		yolk sac rem.
38	81		N 0 0 1 1 0 0 0 0 0 43.0 5.1 0		
39	72		N 0 0 0 2 0 0 0 0 0 1 42.0 5.0 0		yolk sac rem.
40	77		N 0 0 0 1 0 1 0 0 0 1 37.0 5.0 0		yolk sac rem.
41	79		N 0 0 0 1 0 0 0 0 0 1 38.0 4.1 0		yolk sac rem. /yellow
42	79		N 0 0 1 2 0 0 0 0 0 42.0 5.0 0		
43	78		N 0 0 1 1 0 0 0 0 5 0 38.5 5.1 0		yolk sac rem.
44	72		N 0 0 0 1 0 0 0 0 0 0 43.0 5.0 0		
45	80		N 0 0 0 2 0 0 0 0 0 0 44.0 5.0 0		
46	73		N 0 0 0 2 0 1 0 0 0 0 42.0 4.0 0		

47	02	N 0 0 0 1 0 0 0 0 0 44.0 5.5 0	ad
48	81	N 0 0 0 1 0 0 0 0 1 48.0 4.5 0	excess body fat
49	78	N 0 0 1 1 0 0 0 0 0 45.0 4.2 0	yolk sac rem.
50	74	N 0 1 0 2 0 0 1 0 0 45.0 4.2 0	

eyes	= eye	ki dn	= kidney
gill	= gills	livr	= liver
psbr	= pseudobranch	mesn	= mesentery
thym	= thymus	hema	= hematocrit
fat	= fat (pyloric caeca)	spro	= serum protein
spl n	= spleen	oper	= operculum
intn	= intestine		

	Percent	in	Each	Category			
	N/O	1	2	3	4	5	6
Eyes	100	-	-	-	-	-	-
Gill	100	-	-	-	-	-	-
Pseudobranch	90	10	-	-	-	-	-
Thymus	68	32	-	-	-	-	-
-at		46	54	-	-	-	-
Spleen	100	-	-	-	-	-	-
Intestine	92	8	-	-	-	-	-
Kidney	98	2	-	-	-	-	-
Liver	98	-	-	-	-	2	-
Mesentery	88	12	-	-	-	-	-
Operculum	100	-	-	-	-	-	-

	Length	Weight	Hematocrits	Serum Protein
Average	77.64	4.2012	39.15	4.768
Std. Dev.	3.278780	0.080861	3.201952	0.650673
c of v	0.042230	0.019247	0.081786	0.136466
K Factor	0.000008			
C Factor	0.000324			

POND 18, MARCH 16, 1990 RELEASE, SPRING CREEK NFH DIET STUDY  
**WEIGHT: 100 GRY**

FI SH NO.	LN. mm	WT. gm	e g p t f s i k L M h s o y i s h a p n i i e e p P e l b y t l t d v s m r e s l r m n n n r n a 0 r	Remarks
2	77	49	N 0 0 0 2 0 0 0 0 0 0 35.0 5.4 0	yolk sac rem.
3	77		N 0 0 0 1 0 0 0 0 0 0 36.0 6.0 0	excess body fat, lt. pink spl. /hemr
			N 0 0 1 2 0 0 0 0 0 0 34.0 6.3 0	lt. pink spleen
4	76		N 0 0 0 1 0 0 0 0 0 0 36.0 5.2 0	ad
5	82		N 0 0 0 1 0 0 0 0 0 0 37.5 5.3 0	ad
6	76		N 0 0 0 2 0 0 0 0 0 0 33.0 6.0 0	yolk sac rem, lt. pink spl. /blk sp
7	81		N 0 0 0 1 0 0 0 0 0 0 35.0 6.0 0	excess body fat
8	74		N 0 0 0 1 0 0 0 0 0 0 36.0 5.2 0	yolk sac rem.
9	76		N 0 0 0 1 0 0 0 0 0 0 35.5 5.9 0	ad
10	74		N 0 0 0 2 0 0 0 0 0 0 38.0 6.0 0	lt. pink spleen
11	78		N 0 0 0 2 0 0 0 0 0 0 38.0 5.8 0	caseous material kidney
12	69		N 0 0 0 2 0 0 0 0 0 0 37.0 5.1 0	yolk sac, lt. pink spl., kid very p
13	71	46	N 0 0 0 2 0 0 0 0 0 0 39.0 6.5 0	ad
14	74		N 0 0 0 2 0 1 0 0 1 37.0 4.8 0	lt. pink spleen
15	81		N 0 0 1 1 0 0 0 0 0 0 36.0 5.6 0	yolk sac rem.
16	75		N 0 0 0 2 0 0 0 0 0 0 37.5 5.9 0	ad, lt. pink spleen
17	74		N 0 0 0 1 0 0 0 0 0 0 40.0 6.2 0	yolk sac rem.
18	73		N 0 0 0 1 0 0 0 0 0 0 34.5 5.1 0	yolk sac rem, lt. pink spleen
19	75		N 0 0 0 2 0 0 0 0 0 0 39.0 7.5 0	lt. pink spleen/hemm.
20	72		N 0 0 0 2 0 0 0 0 0 0 39.0 5.0 0	ad, lt. pink spleen/hemm.
21	74		N 0 0 0 2 0 0 0 0 0 0 38.0 6.1 0	lt. pink spleen, anal inflamed
22	76		N 0 0 0 1 0 0 0 0 0 0 42.0 6.0 0	lt. pink spleen/black spots/hemm.
23	76		N 0 0 0 1 0 0 0 0 0 0 38.0 6.2 0	lt. pink spleen
24	78		N 0 0 0 1 0 0 0 0 0 0 43.0 5.0 0	ad, lt. pink spleen/hemm.
25	76	44	N 0 0 0 2 0 0 0 0 0 0 39.0 4.1 0	ad, lt. pink spleen
26	77		N 0 1 1 2 0 0 0 0 0 0 38.0 4.8 0	yolk sac rem.
27	80		N 0 0 0 2 0 0 0 0 0 0 37.0 6.0 0	ad, lt. pink spleen
28	70		N 0 0 0 2 0 0 0 0 0 0 35.0 5.1 0	lt. pink spleen/hemm.
29	75		N 0 1 0 1 0 0 0 0 0 0 38.0 5.8 0	lt. pink spleen
30	64		N 0 0 0 1 0 0 0 0 0 0 34.0 5.1 0	lt. pink spleen
31	73		N 0 0 0 1 0 0 1 0 0 0 38.0 6.0 0	ad, Ich on gills, spleen hemorrh
32	64		N 0 0 2 2 0 0 0 0 0 0 38.0 5.0 0	yolk sac rem, spleen hemm.
33	78		N 0 0 1 2 0 0 0 0 0 0 43.0 6.0 0	black spots spleen
34	81		N 0 0 1 1 0 0 0 0 0 0 38.5 6.5 0	ad, lt. pink spleen
35	57		N 0 0 0 2 0 0 1 0 0 0 43.0 5.5 0	very lt. pink spl., fish very sma
36	74		N 0 0 0 1 0 0 0 0 0 0 39.0 6.0 0	lt. pink spleen
37	75	50	N 0 0 1 2 0 0 0 0 1 34.0 5.6 0	anal inflamed
38	76		N 4 1 0 2 0 0 0 0 0 0 46.0 7.1 0	yolk sac rem, lt. pink spleen
39	71		N 0 0 1 1 0 1 0 0 0 0 41.0 6.5 0	lt. pink spleen
40	71		N 4 0 1 1 0 0 0 0 1 35.0 6.1 0	lt. pink spleen
41	72		N 0 0 0 1 0 0 0 0 0 0 38.0 6.0 0	yolk sac rem, lt. pink spleen
42	73		N 0 0 0 2 0 0 0 0 0 0 41.0 6.4 0	yolk sac rem, lt. pink spleen/hem
43	75		N 0 0 0 2 0 0 0 0 0 0 41.0 6.4 0	yolk sac rem, lt. pink spleen/hem
44	80		N 0 1 0 2 0 0 0 0 0 0 40.0 5.2 0	yolk sac rem, rPsb - petechial he
45	77		N 0 0 0 2 0 0 0 0 0 0 39.0 5.8 0	yolk sac rem, Ich on gills
46	72		N 0 0 0 2 0 0 0 0 2 38.0 6.8 0	lt. pink spleen

47	67	N 0 0 1 3 0 0 0 0 1 39.5 6.5 0	very lt. pink spleen/black spots
48	81	N 0 0 0 1 0 0 0 0 0 44.0 7.1 0	
49	67	N 0 0 0 2 0 0 0 0 0 50.0 6.1 0	lt. pink spleen
50	58	N 0 0 0 2 0 0 0 0 0 41.5 5.7 0	Ich on gills, very small fish

eyes = eyes

kidn = kidney

gill = gills

livr = liver

psbr = pseudobranch

mesn = mesentery

thym = thymus

hema = hematocrit

fat = fat (pyloric caeca) spro = serum protein

spln = spleen oper = operculum

intn = intestine

	Percent N/0	in 1	Each 2	Category 3	4	5	6
Eyes	100	-	-	-	-	-	-
Gill	100	-	-	-	-	-	-
Pseudobranch	92	8	-	-	-	-	-
Thymus	80	18	2	-	-	-	-
Fat	-	42	56	2	-	-	-
Spleen	100	-	-	-	-	-	-
Intestine	96	4	-	-	-	-	-
Kidney	96	4	-	-	-	-	-
Liver	100	-	-	-	-	-	-
Mesentery	90	8	2	-	-	-	-
Operculum	100	-	-	-	-	-	-

	Length	Weight	Hematocrit	Serum Protein
Average	73.94		38.45	5.825
Std Dev.	5.243700	0.193521	3.248461	0.657513
c of v	0.070918	0.051212	0.084485	0.112858
K Factor	0.000009			
C Factor	0.000337			

POND 19, MARCH 16, 1990 RELEASE, SPRING CREEK NFH DIET STUDY  
 DIET 1310 DRY

ISH NO.	LN. mm	WT. gm	e g p t f s i k l m h s o	y i s h a p n i i e e P P	e l b y t l t d v s m r e	s l r m n n n r n a 0 r	Remarks
1	80	43	N 0 0 0 1 0 0 0 0 0 34.0 4.9 0	yolk sac rem.			
2	71		N 0 0 1 1 0 0 0 0 0 37.0 4.5 0				
3	72		N 0 1 1 1 0 0 0 0 0 37.0 4.8 0	lt. pink spleen/black spots			
4	75		N 0 0 0 2 0 0 0 0 0 31.5 6.0 0	yolk sac rem.			
5	72		N 0 1 0 1 0 0 0 0 0 37.0 5.5 0				
6	76		N 0 0 1 2 0 0 0 0 0 31.5 6.0 0	yolk sac rem.			
7	61		N 4 3 0 1 0 0 0 0 0 40.0 2.9 0	spleen pale, liver yellow, kid 1t gr			
8	72		N 0 1 0 1 0 0 0 0 0 38.0 4.0 0	ad			
9	72		N 0 0 1 2 0 0 0 0 0 37.0 5.1 0	bad ad clip			
10	75		N 0 0 0 1 0 0 0 0 0 40.0 4.0 0	caseous material kidney			
11	80		N 0 1 2 1 0 0 0 0 0 45.0 6.1 0	yolk sac, Ich gills, excess body f			
12	70		N 0 1 0 2 0 0 0 0 0 40.0 5.8 0	bad ad clip			
13	80	47	N 0 0 0 2 0 0 0 0 0 39.0 5.1 0				
14	69		N 0 1 0 1 0 0 0 0 0 36.0 5.0 0	yolk sac rem.			
15	76		N 0 1 0 2 0 0 0 0 0 35.5 6.2 0				
16	77		N 0 0 0 1 0 0 0 0 0 36.5 5.1 0				
17	74		N 0 0 0 1 0 0 0 0 0 37.0 5.3 0				
18	82		N 0 0 0 1 0 0 0 0 0 38.0 5.8 0	lt. pink spleen			
19	76		N 4 0 0 2 0 0 0 0 0 36.0 6.1 0				
20	76		N 4 0 0 2 0 0 0 0 0 39.0 0.0 0	yolk sac rem, lt. pink spleen			
21	80		N 0 0 0 1 0 0 0 0 0 42.0 5.1 0	yellow fat			
22	81		N 4 0 0 1 0 0 0 0 0 41.0 4.1 0				
23	63		N 0 0 0 3 0 0 0 0 0 38.0 4.1 0	yolk sac, lt pink spl, anal inflame			
24	74		N 0 0 0 1 0 0 0 0 0 40.0 6.1 0				
25	77	52	N 0 0 0 2 0 0 0 0 0 36.0 7.6 0	yolk sac rem.			
26	74		N 0 0 0 1 0 0 0 0 0 38.0 5.2 0				
27	76		N 0 0 0 1 0 0 0 0 0 42.0 6.0 0	yolk sac rem.			
28	82		N 0 0 0 1 0 0 0 0 1 38.0 5.0 0	ad, yolk sac rem.			
29	77		N 0 0 0 1 0 0 0 0 0 39.0 5.8 0	black spots spleen			
30	76		N 0 0 0 1 0 0 0 0 0 33.5 5.7 0	lt. pink spleen/hemm.			
31	71		N 0 0 0 2 0 0 0 0 0 39.0 3.5 0				
32	80		N 0 0 0 1 0 0 0 0 0 34.0 5.6 0	lt. pink spleen			
33	72		N 0 0 0 1 0 0 0 0 0 34.0 5.1 0				
34	74		N 0 0 0 2 0 0 0 0 0 37.0 4.5 0	lt. pink spleen/hemm.			
35	69		N 0 0 1 2 0 0 0 0 1 32.0 4.7 0	lt. pink spleen			
36	73		N 0 0 0 2 0 0 0 0 0 37.0 4.6 0	yolk sac rem, spleen hemm.			
37	79		N 0 1 0 2 0 0 0 0 0 38.5 5.3 0				
38	74	47	N 0 0 0 1 0 0 0 0 0 40.0 5.9 0	spleen hemm.			
39	75		N 0 0 0 2 0 0 0 0 0 40.0 5.0 0	lt. pink spleen			
40	76		N 0 0 0 2 0 0 0 0 0 35.0 6.5 0	ad, lt. pink spleen			
41	72		N 0 0 0 1 0 0 0 0 0 31.0 6.2 0	yolk sac rem, lt pink spl/blk sp			
42	74		N 0 0 0 1 0 0 0 0 0 32.5 4.2 0	yolk sac rem.			
43	75		N 0 0 0 2 0 0 0 0 0 30.0 5.1 0				
44	02		N 0 0 1 2 0 0 0 0 0 33.0 5.8 0	excess body fat			
45	75		N 0 0 0 2 0 0 0 0 0 33.5 4.2 0				
46	82		N 0 0 0 2 0 0 0 0 0 36.5 5.6 0	lt. pink spleen			

47	81	N 0 0 0 2 4 0 0 0 0 33.5 4.5 0	yolk sac rem.
48	71	N 0 0 0 2 0 0 0 0 30.0 5.0 0	ad, yolk sac rem, <b>lt.</b> pink spleen
49	70	N 0 0 0 1 0 0 0 0 35.0 5.0 0	
50	65	N 0 0 0 2 0 0 0 6 0 36.0 4.2 0	<b>lt.</b> pink spleen/hemm.

eyes	= eyes	ki dn	= ki dney
gill	= gills	livr	= liver
psbr	= pseudobranch	mesn	= mesentery
thym	= thymus	hema	= hematocrit
fat	= fat (pyloric caeca)	spro	= serum protein
spln	= spleen	oper	= operculum
intn	= intestine		

	Percent	in	Each	Category			
	N/D	1	2	3	4	5	6
Eyes	100	-	-			-	-
Gills	92	-	-		8	-	-
Pseudobranch	82	16	-	2	-	-	-
Thymus	86	12	2			-	-
Fat	52	46	2		-	-	-
Spleen	98	-	-		2	-	-
Intestine	100	-	-			-	-
Kidney	100	-	-			-	-
Liver	98	-	-			-	-
Mesentery	96	4	-			-	-
Operculum	100	-	-			-	-

	Length	Weight	Hematocrits	Serum Protein
Average	74.94	3.7994	36.6	5.068
Std. Dev.	4.640732	0.372077	3.266496	1.110394
c of v	0.061925	0.097930	0.089248	0.219099
K Factor	0.000009			
C Factor	0.000326			

POND 20, MARCH 16, 1990 RELEASE, SPRING CREEK NFH DIET STUDY

**DIET - AISEKNATHY**

I SH NO.	LN. mm	WT. gm	e g p t f s i k l m h y i s h a p n i i e e e l b y t l t d v s m s l r m n n n r n a	s o p P r e 0 r	Remarks
1	78	52	N 0 0 0 2 0 0 0 0 0 39.0	4.8 0	lt. pink spleen/hemm.
2	81		<b>N 0 0 0 2 0 0 0 0 0</b> 40.0	5.2 0	yolk sac rem.
3	70		N 0 0 0 3 0 0 0 0 0	38.5 4.8 0	yolk sac rem.
4	76		<b>N 0 0 0 1 0 0 0 0 1</b> 42.0	5.5 0	yolk sac rem.
5	77		N 0 0 0 2 0 0 0 0 0	35.0 3.9 0	ad
6	75		N 0 0 0 1 0 0 0 0 0	37.0 3.1 0	black spots spleen
7	82		N 0 0 0 2 0 0 0 0 0	38.0 4.8 0	fatty material on side of liver
8	84		N 0 0 0 1 0 0 0 0 0	39.0 5.0 0	fatty material on liver
9	79		N 0 0 0 2 0 0 0 0 0	46.0 4.0 0	
10	80		N 0 0 0 2 0 0 0 0 0	37.0 5.0 0	
11	84		N 4 0 0 2 4 0 0 0 0	40.0 4.8 0	yolk sac rem, caseous material kid
12	81		N 0 0 1 2 0 0 0 0 0	44.0 4.5 0	
13	73	53	N 0 1 0 2 0 0 0 1 0	44.0 4.1 0	
14	74		N 0 0 1 2 0 0 0 0 0	45.0 3.0 0	yolk sac rem.
15	83		N 0 1 0 1 4 0 0 0 0	43.0 3.8 0	ad
16	74		<b>N 0 0 0 1 4 0 0 0 0</b> 41.0	3.1 0	ad
17	85		N 0 0 0 1 0 0 0 0 0	41.0 4.1 0	black spots spleen
18	76		N 0 0 0 1 0 0 0 0 0	40.0 4.5 0	spleen hemorrhaged
19	81		N 0 0 1 3 0 0 0 0 0	41.5 4.1 0	
20	72		N 0 0 0 2 0 0 0 0 0	43.0 4.1 0	yolk sac rem.
21	84		N 0 0 0 1 0 0 0 0 0	38.0 4.0 0	yolk sac rem, excess body fat
22	82		N 0 0 0 2 0 0 0 0 0	42.5 3.8 0	yolk sac rem, Ich on gills
23	76		N 0 0 1 1 0 0 0 0 0	44.5 2.5 0	Psbr. has petechial hemm.
24	86		<b>N 0 1 1 1 0 0 0 0 0</b> 43.0	6.1 0	yolk sac, excess body fat, spl hemm
25	76	46	N 0 1 0 2 0 0 0 0 0	37.0 4.0 0	ad
26	75		<b>N 0 0 0 2 0 0 0 0 0</b> 34.0	3.8 0	ad, Psbr. petechial hemm.
27	75		N 0 1 0 2 0 0 0 0 0	40.0 4.8 0	ad, yolk sac rem.
28	78		N 0 0 0 1 0 0 0 0 0	38.0 4.5 0	
29	74		N 0 0 1 1 0 0 0 0 0	44.0 4.0 0	
30	60		<b>N 0 0 0 1 0 0 0 6 0</b> 40.0	4.0 0	
31	75		<b>N 0 0 0 3 0 0 0 0 0</b> 41.0	4.2 0	
32	77		<b>N 0 0 0 2 0 0 0 0 0</b> 37.0	3.8 0	
33	67		N 0 0 0 2 0 0 0 0 0	41.0 4.1 0	yolk sac rem.
34	80		N 0 1 2 1 0 0 0 0 0	38.0 5.0 0	anal inflamed
35	78		N 0 0 1 1 0 0 0 0 0	41.0 3.9 0	
36	84		N 0 0 0 2 0 0 0 0 0	42.0 4.9 0	
37	79	61	N 0 0 0 1 0 0 0 0 0	41.0 5.3 0	
38	79		N 0 0 0 1 0 0 0 0 0	42.5 4.5 0	
39	85		N 0 0 0 2 4 0 0 0 1	41.0 4.1 0	ad
40	84		<b>N 0 0 0 2 0 0 0 0 0</b> 41.0	4.2 0	ad, spleen hemm.
41	79		<b>N 0 1 1 1 0 0 0 0 0</b> 34.0	4.3 0	spleen hemm.
42	80		<b>N 0 0 1 2 0 0 0 0 0</b> 43.5	4.2 0	yolk sac rem, caseous material ki
43	73		N 0 0 2 2 0 0 0 0 0	39.0 4.1 0	spleen hemm.
44	74		<b>N 0 1 0 2 0 0 0 0 0</b> 38.0	4.1 0	
45	77		<b>N 0 0 0 2 0 0 0 0 0</b> 40.0	4.4 0	
46	74		N 0 0 0 1 0 0 0 0 0	44.5 4.1 0	spleen hemm.
					spleen black spots

47	77	N 0 0 0 2 0 1 0 0 0 42.0 3.2 0
48	80	N 0 0 0 2 0 0 0 0 0 42.0 5.0 0
49	74	N 4 0 0 2 0 0 0 0 0 41.5 4.2 0
50	80	N 0 0 0 2 0 0 0 0 1 46.5 5.2 0

eyes	= eyes	ki dn	= ki dney
gill	= gills	l i vr	= liver
psbr	= pseudobranch	mesn	= mesentery
t hym	= thymus	hema	= hematocrit
fat	= fat (pyloric caeca)	spro	= serum protein
spl n	= spleen-	oper	= operculum
i nt n	= intestine		

	Percent	in	Each	Category			
	N/0	1	2	3	4	5	6
Eyes	100						
Gills	96					4	
Pseudobranch	84	16	-				
Thymus	78	18	4				
Fat	38	56	6				
Spleen	92				8		
Intestine	98	2	-				
Kidney	100						
Liver	96	2	-			2	
Mesentery	94	6	-				
Ooerculum	100						

	Length	Weight	Hematocrits	Serum Protein
Average	77.74	4.24	40.63	4.29
Std. Dev.	4.885939	0.232585	2.864978	0.666708
c of v	0.062849	0.054855	0.070513	0.155409
K Factor-	0.000009			
C Factor	0.000326			

Fish No.	Ln. mm	Wt. gms	e	g	p	t	f	s	i	k	l	m	h	s	0	Remarks											
			y	i	s	h	a	p	n	i	e	e	P	P	s	l	r	m	n	n	r	n	a	0	r		
1	83	52.0	N	0	0	1	1	0	0	0	0	0	36.0	5.0	0	yol	k	sac	rem.								
2	78		N	0	0	0	2	0	0	0	0	0	42.0	3.8	0	yol	k	sac	rem.								
3	77		N	0	0	0	2	5	0	0	0	0	35.0	4.8	0												
4	76		N	0	0	1	2	0	0	0	0	0	44.0	4.6	0	yol	k	sac	rem.	, lt	pink	spleen					
5	82		N	0	0	0	2	0	0	0	6	0	43.0	4.5	0												
6	72		N	0	0	0	2	0	0	0	0	0	36.0	3.6	0	yol	k	sac	rem.								
7	81		N	0	0	0	2	0	0	0	0	0	40.0	5.0	0	yol	k	sac	rem.								
8	82		N	0	0	0	1	0	0	0	0	0	41.0	4.5	0												
9	74		N	0	0	0	2	0	0	0	0	0	38.0	3.8	0	Fatty	type	spot	on	kidney							
10	70		N	0	0	0	2	0	0	0	0	0	39.0	3.8	0												
11	63		N	0	'0	0	2	0	0	0	0	0	41.0	4.5	0	Ich	gills										
12	82		N	0	0	0	2	0	0	0	0	0	40.0	3.3	0	yol	k	sac	rein.	, Ich	gills						
13	72	46.0	N	0	0	1	2	0	0	0	0	0	39.0	3.4	0												
14	79		N	0	0	0	2	0	0	0	0	0	38.0	4.1	0												
15	82		N	0	0	1	2	0	0	0	0	0	42.0	4.6	0	Excess	body	fat									
16	76		N	0	0	0	1	0	1	0	0	1	38.0	4.3	0												
17	81		N	0	0	0	1	0	0	0	0	0	39.0	4.4	0												
18	79		N	0	0	0	1	0	0	0	0	0	40.0	3.5	0	Black	spots	spleen									
19	76		N	0	0	0	1	0	0	0	0	0	40.0	3.6	0												
20	75		N	0	0	0	1	0	0	0	0	0	43.0	3.1	0												
21	69		N	0	0	0	1	0	0	0	0	0	43.0	2.9	0	Black	spots	spleen									
22	79		N	0	0	0	1	0	1	0	0	0	46.0	3.3	0												
23	65		N	0	0	2	1	0	0	0	6	0	38.0	3.5	0												

eyes	= eye	kidn	= kidney
gill	= gill	livr	= liver
psbr	= pseudobranch	mesn	= mesentary
thym	= thymus	hema	= hematocrits
fat	= fat (pyloric caeca)	spro	= serum protein
sp1n	= spleen	oper	= opercular
intrn	= intestine		

	Length	Weight	Hematocrits	Serum Protein
Average	76.21739	4.258261	40.04347	3.995652
Stdv.	5.460980	0.074929	2.678063	0.613952
c of v	0.071650	0.017596	0.066878	0.153655
K Factor	0.0000096			
C Factor	0.0003475			

Pond 22. March Release Fish, Sampled 3/14/90

Fish No.	Ln. mm	wt. gms	e	g	p	t	f	s	i	k	l	m	h	s	0	Remarks
			y	i	s	h	a	p	n	i	e	e	p	P		
			sl	r	m	n	n	n	r	n	a	0	r			
1	79	51.0	N	0	0	1	1	0	0	0	0	41.0	4.5	0	ad	
2	74		N	0	0	1	1	0	0	1	0	39.0	4.4	0		
3	77		N	0	0	0	2	0	0	0	0	41.0	4.4	0		
4	78		N	0	0	2	1	0	0	0	0	40.0	5.0	0		
5	83		N	0	0	1	2	0	0	0	1	40.0	5.2	0	yolk sac rem.	
6	76		N	0	0	1	1	0	1	0	0	41.0	3.6	0		
7	78		N	0	0	1	1	0	0	0	0	42.0	5.2	0		
8	76		N	0	0	0	1	0	0	0	0	42.0	5.0	0	Black spots spleen	
9	75		N	0	0	0	1	0	0	0	0	44.0	4.4	0	yolk sac rem.	
10	70		N	0	0	0	2	0	0	0	0	43.0	4.5	0	yolk sac rem.	
11	75		N	0	0	1	1	0	0	0	0	43.0	4.8	0		
12	80		N	0	0	0	2	0	0	0	0	43.0	5.3	0	yolk sac rem. (yellowish)	
13	84	43.0	N	0	1	1	2	5	0	0	0	42.0	5.0	0		
14	74		N	0	0	1	1	0	0	0	0	37.0	4.2	0	Black spots spleen	
15	77		N	0	0	1	2	0	0	0	0	35.0	4.5	0		
16	65		N	0	0	0	2	0	0	0	0	39.0	4.0	0		
17	71		N	0	0	0	2	0	0	0	0	42.0	3.4	0		
18	76		N	0	0	0	2	0	0	0	0	40.0	4.7	0		
19	83		N	0	0	0	2	0	1	0	0	42.0	4.9	0		
20	70		N	0	0	0	2	0	0	0	0	39.0	4.2	0		
21	78		N	0	0	0	1	0	0	0	0	40.0	4.5	0		
22	70		N	0	0	0	2	0	0	0	0	40.0	4.9	0	Anal inflamed	
23	75		N	0	0	1	2	0	0	0	0	43.0	5.5	0	yolk sac rem.	

eyes	= eye	ki dn	= kidney
gill	= gill	livr	= liver
psbr	= pseudobranch	mesn	= mesentary
thym	= thymus	hema	= hematocrits
fat	= fat (pyloric caeca)	spro	= serum protein
spl n	= spleen	oper	= opercular
int n	= intestine		

	Length	Weight	Hematocrits	Serum Protein
Average	76.17391	4.087391	40.78260	4.613043
Stdv.	4.340428	0.169839	2.063271	0.511012
c of v	0.056980	0.041552	0.050591	0.110775
K Factor	0.0000092			
C Factor	0.0003341			

Pond 25, March Release Fish, Sampled 3/14/90

Fish No.	Ln. mm	Wt. ( g)	e	g	p	t	f	s	i	k	l	m	h	s	o	Remarks
			v	i	s	h	a	p	n	i	i	e	e	p	p	
			e	l	b	y	t	i	t	d	v	s	m	r	e	
			s	l	r	m	n	n	n	r	n	a	0	r		
1	74	54.0	N	0	0	0	1	0	0	0	0	36.0	4.8	0	Black spots spleen, yellow fat	
2	77		N	0	0	0	1	0	0	0	0	45.0	4.2	0		
3	84		N	0	0	2	2	0	0	0	0	40.0	4.4	0	yolk sac rem.	
4	83		N	0	0	0	1	0	0	0	0	44.0	4.0	0		
5	80		N	0	0	0	10	00	0	0	0	36.0	4.8	0		
6	66		N	000	2	0	0	0	0	0	0	41.0	3.2	0	yolk sac, blk spots spleen	
7	80		N	0	0	0	2	0	0	0	0	35.	5.4	0		
8	81		N	0	0	0	2	0	0	0	0	40.0	6.2	0	yolk sac rem.	
9	82		N	0	0	1	1	0	0	0	0	44.0	4.4	0	yolk sac rem.	
10	77		N	0	0	0	1	5	0	0	0	43.0	4.2	0	Ich gills	
11	80		N	0	0	0	2	0	0	0	0	44.0	8.2	0	Black spots spleen	
12	77		N	0	0	0	1	0	0	0	0	43.0	5.6	0	yolk sac rem.	
13	80	46.0	N	0	0	0	2	0	0	0	0	39.0	4.3	0		
14	82		N	0	0	0	1	0	0	0	0	40.0	4.9	0	Ich gills	
15	76		N	0	0	0	1	0	0	0	0	47.0	4.3	0		
16	75		N	0	0	0	1	0	0	0	0	44.0	4.5	0		
17	78		N	0	0	1	1	0	0	0	0	44.0	4.8	0	yolk sac rem.	
18	73		N	0	0	0	2	0	0	0	0	38.0	4.3	0	lt pink spleen	
19	76		N	0	0	1	1	0	0	0	0	43.0	4.7	0	Orange yolk sac rem.	
20	72		N	0	0	0	2	0	0	0	0	42.0	4.4	0		
21	73		N	0	0	0	2	0	0	0	0	41.0	4.5	0	lt pink spleen	
22	84		N	0	0	0	1	0	0	0	0	43.0	4.5	0		
23	76		N	0	0	1	2	0	0	0	0	42.0	4.6	0		

eyes	= eye	ki dn	= ki dney
gill	= gill	li vr	= liver
psbr	= pseudobranch	mesn	= mesentary
thym	= thymus	hema	= hematocrits
fat	= fat (pyloric caeca)	spro	= serum protein
spl n	= spleen	oper	= opercular
intn	= intestine		

	Length	Weight	Hematocrits	Serum Protein
Average	77.65217	4.346957	41.47826	4.747826
Stdv.	4.279462	0.159849	3.034147	0.931044
c of v	0.055110	0.036773	0.073150	0.196099
K Factor	0.0000093			
C Factor	0.0003354			

Pond 26, March Release Fish, Sampled 3/14/90

Fish No.	Ln. mm	Wt. gms	e	g	p	t	f	s	i	k	l	m	h	s	o	Remarks
			y	i	s	h	a	p	n	i	i	e	e	p	p	
			e	l	b	y	t	l	t	d	v	s	m	r	e	
			s	l	r	m	n	n	n	r	n	a	o	r		
1	79	51.0	N	0	0	0	1	0	0	0	0	42.0	4.0	0	yolk sac rem.	
2	67		N	0	0	0	2	0	0	0	0	43.0	2.7	0	ad	
3	76		N	0	0	1	1	0	0	0	0	41.0	4.0	0		
4	74		N	0	0	0	2	0	0	0	0	36.0	3.0	0	Black spots spleen	
5	77		E	l	0	0	2	2	0	0	0	41.0	5.0	0	Yellow fat	
6	76		N	0	0	1	1	0	0	0	0	48.0	4.0	0	ad	
7	78		N	0	0	0	2	0	0	0	0	43.0	4.8	0	yolk sac rem.	
8	81		N	0	0	0	1	0	0	0	0	45.0	5.5	0		
9	78		N	0	0	0	1	0	0	0	0	40.0	5.1	0	yolk sac rem.	
10	77		N	0	0	0	2	0	0	0	0	46.0	5.6	0	Blocked white kd tubule	
11	76		N	0	0	0	2	0	0	0	0	44.0	5.2	0		
12	86		N	0	0	1	1	0	0	0	0	41.0	5.5	0	yolk sac rem.	
33	76	35.0	N	0	0	0	2	0	0	0	0	34.0	4.9	0	spleen hemm.	
14	60		B	2	0	0	2	0	0	0	1	48.0	2.0	0	Fins 25% eroded	
15	74		N	0	0	1	1	0	0	0	0	42.0	3.8	0	yolk sac rem.	
16	81		N	0	0	1	1	0	0	0	0	40.0	6.0	0		
17	72		N	0	0	0	1	0	0	0	0	42.0	2.6	0	Black spots spleen	
18	76		N	0	0	0	1	0	0	0	0	38.0	5.4	0	yolk sac rem.	
19	79		N	0	0	0	1	0	0	0	0	45.0	5.2	0		
20	58		N	0	0	0	1	0	0	0	0	46.0	2.0	0		
21	75		N	0	0	0	1	0	0	0	0	35.0	5.0	0		
22	77		N	0	0	0	1	0	0	0	1	45.0	4.2	0		

eyes	= eye	kidn	= kidney
gill	= gill	livr	= liver
psbr	= pseudobranch	mesn	= mesentary
thym	= thymus	hema	= hematocrits
fat	= fat (pyloric caeca)	spro	= serum protein
spl n	= spleen	oper	= opercular
int n	= intestine		
E	= exophthalmia		
B	= blind		

	Length	Weight	Hematocrits	Serum Protein
Average	75.13636	3.891304	42.04545	4.340909
Stdv.	6.210661	0.374645	3.771631	1.181931
c of v	0.082658	0.096278	0.089703	0.272277
K Factor	0.0000092			
C Factor	0.0003314			

Hatchery: Spring Creek NFH Date: 04/10/90 Pond Number: 28  
 April Release, Goedes Test

FISH NO.	LN. mm	WT. gm	e	g	p	t	f	s	i	k	1	m	h	s	o	Remarks
			y	i	s	h	a	p	n	i	i	e	e	p	p	
			e	l	b	y	t	l	t	d	v	s	m	r	e	
			s	l	r	m	n	n	n	r	n	a	o	r		
1	95	98	N	0	0	0	2	0	0	0	0	0	35.0	4.0	0	yolk sac
2	95		N	0	0	0	3	0	0	0	0	0	44.0	4.0	0	
3	85		N	0	1	0	2	0	0	0	0	0	46.0	5.3	0	
4	87		N	0	0	0	2	0	0	0	0	0	44.0	5.7	0	
5	96		N	0	0	0	2	0	0	0	0	0	45.0	3.3	0	
6	94		N	0	0	1	3	0	0	0	0	0	47.0	5.0	0	
7	<b>89</b>		N	0	0	1	2	0	0	0	0	0	46.0	3.7	0	
8	<b>95</b>		N	0	0	0	0	2	0	0	0	0	47.0	4.2	0	Ich
9	89		N	0	0	0	3	<b>0</b>	0	0	0	0	47.0	4.9	0	Ich
10	96		N	0	1	0	3	0	0	0	0	0	52.0	4.0	0	Ich
11	90		N	0	0	0	3	0	0	0	0	0	47.0	5.0	0	
12	90		N	0	0	0	3	0	0	0	0	0	43.0	4.5	0	Ich, fat deposits kidney
13	90		N	0	0	0	3	0	0	0	0	0	49.0	4.3	0	
14	93		N	0	0	1	3	0	0	0	0	0	<b>46.0</b>	3.9	0	

	Length	Weight	Hematocrits	Serum Protein
Average	91.71428	6.551020	45.57142	4.414285
Std. Dev.	3.452298	0	3.639354	0.652311
c of v	0.037641	0	0.079860	0.147772
K Factor	0.000008			
C Factor	0.000306			

	Percent in Each Category						
	N/0	1	2	3	4	5	6
Eyes	100	-	-	-	-	-	-
Gill	100	-	-	-	-	-	-
Pseudobranch	86	<b>14</b>	-	-	-	-	-
Thymus	79	<b>21</b>	-	-	-	-	-
Fat	-	43	<b>57</b>	-	-	-	-
Spleen	100	-	-	-	-	-	-
Intestine	100	-	-	-	-	-	-
Kidney	100	-	-	-	-	-	-
Liver	100	-	-	-	-	-	-
Mesentery	100	-	-	-	-	-	-
Operculum	100	-	-	-	-	-	-

Hatchery: Spring Creek NFH Date: 04/10/90 Pond Number: 29  
 April - Release, Goedes Test

FI SH NO.	LN. mm	WT. gm	e y	g i	p s	t h	f a	s p	i n	k i	l e	m e	h p	s p	o p	Remarks
			e	l	b	y	t	l	t	d	v	s	m	r	e	
			s	l	r	m	n	n	n	r	n	a	o	r		

1	94	99	N	0	0	0	2	0	0	0	0	0	39.0	3.9	0	
2	95		N	0	0	0	2	0	0	0	0	0	47.0	2.8	0	
3	96		N	0	0	1	3	0	0	0	0	0	40.0	3.0	0	
4	93		N	0	0	0	2	0	0	0	0	0	44.0	5.3	0	
5	87		N	0	0	0	2	0	0	0	0	0	51.0	3.4	0	ad
6	94		N	0	0	0	3	0	0	0	0	0	42.0	4.0	0	
7	84		N	0	0	0	2	0	0	0	0	0	50.0	4.7	0	
8	90		N	0	0	0	3	0	0	0	0	0	51.0	3.9	0	Ich, anal inflamed
9	95		N	0	0	0	2	0	0	0	0	0	47.0	3.9	0	
10	85		N	0	0	1	2	0	0	0	0	0	47.0	4.5	0	
11	88		N	0	0	0	2	0	0	0	0	0	53.0	3.7	0	
12	100		N	0	0	1	2	0	0	0	0	0	41.0	3.7	0	Ich
13	94		N	0	0	0	3	0	0	0	0	0	50.0	3.9	0	Ich
14	95		N	0	0	0	2	0	0	0	0	0	44.0	4.1	0	

	Length	Weight	Leucocrits	Serum Protein
Average	92.14285	6.581632	46.14285	3.914285
Std. Dev.	4.453044	0	4.372922	0.618589
c of v	0.048336	0	0.094769	0.158033
K Factor	0.000008			
C Factor	0.000303			

	Percent in Each Category				
	N/0 1 2 3 4 5 6				
Eyes	100				
Gill	100				
Pseudobranch	100				
Thymus	79 21	- -	- -	- -	
Fat		71	29	-	-
Spleen	100				
Intestine	100				
Kidney	100				
Liver	100				
Mesentery	100				
Operculum	100				

Hatchery: Spring Creek NFH Date: 04/10/90 Pond Number: 32  
 April Release, Goedes Test

FISH NO.	LN. mm	WT. gm	e g p t f s i k l m h s o												Remarks	
			y i s h a p n i i e e p p	e l b y t l t d v s m r e	s l r m n n n r n a o r											
1	100	96	N	0	0	0	2	0	0	0	0	0	45.0	3.3	0	fat deposits kidney
2	86		N	0	0	0	3	0	0	0	0	0	45.0	4.2	0	
3	89		N	0	0	0	2	0	0	0	0	0	40.0	3.0	0	
4	85		N	0	0	0	2	0	0	0	0	0	44.0	3.7	0	
5	88		N	0	0	0	2	0	0	0	0	0	48.0	3.3	0	ad
6	94		N	0	0	0	2	4	0	0	0	0	41.0	4.5	0	
7	96		N	0	0	1	2	0	0	0	0	0	42.0	4.2	0	hem. spleen
8	07		N	0	0	0	2	0	0	0	0	0	46.0	2.0	0	ad, fat deposit kidney
9	95		N	0	0	0	2	0	0	0	0	0	43.0	3.1	0	
10	95		N	0	0	0	3	0	0	0	0	0	44.0	3.4	0	Ich, yellow fat
11	84		N	0	0	0	2	0	0	0	0	0	42.0	3.9	0	black spots spleen
12	94		N	0	0	1	2	4	0	0	0	0	45.0	2.8	0	
13	93		N	0	0	1	2	0	0	0	0	0	47.0	3.7	0	
14	86		N	0	0	0	3	0	0	0	0	0	48.0	4.2	0	

	Length	Weight	Hematocrits	Serum Protein
Average	90.85714	6.857142	44.28571	3.521428
Std. Dev.	4.808580	0	2.403229	0.185029
t of v	0.052924	0	0.054266	0.185029
< Factor	0.000009			
C Factor	0.000330			

	Percent in Each Category						
	N/0	1	2	3	4	5	6
Eyes	100	-	-	-	-	-	-
Gill	100	-	-	-	-	-	-
Pseudobranch	100	-	-	-	-	-	-
Thymus	79	21	-	-	-	-	-
Fat			79	21	-	-	-
Spleen	86	-	-	-	14	-	-
Intestine	100	-	-	-	-	-	-
Kidney	100	-	-	-	-	-	-
Liver	100	-	-	-	-	-	-
Mesentery	100	-	-	-	-	-	-
Operculum	100	-	-	-	-	-	-

Hatchery: Spring Creek NFH Date: 04/10/90 Pond Number: 33  
 April Release, Goedes Test

FISH NO.	LN. mm	WT. gm	e g p t f s i k l m h s o												Remarks
			y i s h a p n i e e p p	e l b y t l t d v s m r e	s l r m n n n r n a o r										
1	96	107	N	0	0	1	2	0	0	0	0	48.0	4.0	0	ad
2	94		N	0	0	0	2	0	0	0	0	49.0	3.3	0	
3	96		N	0	0	0	2	0	0	0	0	47.0	2.1	0	yolk sac
5	85		N	0	0	0	2	0	0	0	0	45.0	4.3	0	
6	94.94		N	0	0	0	2	0	0	0	0	51.0	4.0	0	It. pink spleen
			N	0	0	1	2	0	0	0	0	44.0	4.3	0	excess body fat
7	96		N	0	0	0	2	0	0	0	0	45.0	3.3	0	yolk sac, excess body fat
8	102		N	0	0	1	3	4	0	0	0	44.0	3.2	0	
9	86		N	0	0	0	2	0	0	0	0	49.0	4.3	0	
10	94		N	0	0	0	2	0	0	0	0	41.0	4.3	0	
11	96		N	0	0	0	2	0	0	0	0	47.0	3.2	0	
12	90		N	0	0	1	3	0	0	0	0	41.0	5.2	0	
13	89		N	0	0	0	3	0	0	0	0	42.0	4.7	0	ad
14	94		N	0	0	0	3	0	0	0	0	48.0	4.9	0	ad

	Length	Weight	Hematocrits	Serum Protein
Average	93.28571	7.642857	45.78571	3.935714
Std. Dev.	4.299976	0	3.027931	0.797860
c of v	0.046094	0	0.066132	0.202723
K Factor	0.000009			
C Factor	0.000340			

	Percent in Each Category						
	N/O	1	2	3	4	5	6
Eyes	100	-	-	-	-	-	-
Gill	100	-	-	-	-	-	-
Pseudobranch	100	-	-	-	-	-	-
Thymus	71	29	-	-	-	-	-
Fat			71	29	-	-	-
Spleen	93	-	-	-	7	-	-
Intestine	100	-	-	-	-	-	-
Kidney	100	-	-	-	-	-	-
Liver	100	-	-	-	-	-	-
Mesentery	100	-	-	-	-	-	-
Operculum	100	-	-	-	-	-	-

Hatchery: Spring Creek NFH Date: 04/10/90 Pond Number: 34  
 April Release, Goedes Test

FISH NO.	LN. mm	WT. gm	e g p t f s i k l m h s o												Remarks
			y i s h a p n i i e e p p	k l b y t l t d v s m r e	s l r m n n n r n a o r										
1	96	98	N	0	0	0	2	0	0	0	0	0	40.0	5.3	0
2	<b>90</b>		N	0	0	1	2	0	0	0	0	0	42.0	4.6	0
3	86		N	0	0	0	2	0	0	0	0	0	41.0	4.3	0
4	94		N	0	0	1	2	0	0	0	0	0	45.0	4.3	0
5	86		N	0	0	2	2	0	0	0	0	0	45.0	4.4	0
6	85		N	0	1	0	2	0	0	0	0	0	47.0	4.4	0
7	88		N	0	0	0	1	0	0	0	0	0	37.0	3.6	0
8	90		N	0	0	0	2	0	0	0	0	0	44.0	3.1	0
9	97		N	0	0	0	2	0	0	0	0	0	43.0	4.0	0
10	99		N	0	0	0	2	0	0	0	0	0	40.0	4.9	0
11	<b>90</b>		N	0	0	0	2	0	0	0	0	0	40.0	3.8	0
12	<b>88</b>		N	0	0	0	2	0	0	0	0	0	42.0	4.2	0
<b>13</b>	95		N	0	0	0	3'	0	0	0	0	0	43.0	4.5	0
<b>14</b>	91		N	0	0	0	2	0	0	0	0	0	43.0	4.0	0

	Length	Weight	Hematocrits	Serum Protein
Average	91.07142	7	42.28571	4.242857
Std. Dev.	4.283928	0	2.490799	0.523333
c of v	0.047039	0	0.058904	0.123344
K Factor	0.000009			
C Factor	0.000334			

	N/0	Percent in Each Category	1	2	3	4	5	6
Eyes	100							
Gill	100						-	
Pseudobranch	<b>93</b>		7	-	-	-	-	
Thymus	<b>79</b>		14	7	-	-	-	
Fat			7	86	7	-	-	
Spleen	100							
Intestine	100							
Kidney	100							
Liver	100							
Mesentery	100							
Operculum	100							

Hatchery: Spring Creek NFH Date: 04/10/90 Pond Number: 35  
 April Release, Goedes Test

FISH NO.	LN. mm	WT. gm	e g p t f s i k l m h s o y i s h a p n i e e p p e l b y t l t d v s m r e s l r m n n n r n a o r	Remarks
1	96	104	N 0 0 0 2 0 0 0' 0 0 39.0 4.3 0	
2	95		N 0 0 0 2 0 0 0 0 0 38.0 3.9 0	yolk sac
3	93		N 0 0 1 2 0 0 0 0 0 45.0 3.2 0	
4	90		N 4 0 1 2 0 0 0 0 0 39.0 3.1 0	yolk sac
5	103		N 0 0 0 2 0 0 0 0 0 44.0 4.0 0	<b>ad</b>
6	93		<b>N 0 0 0 2 4 0 0 0 0 42.0 3.8 0</b>	
7	94		N 0 0 1 2 0 0 0 0 0 44.0 4.3 0	
8	90		N 0 0 0 2 0 0 0 0 0 39.0 3.6 0	
9	90		N 0 1 2 2 0 0 0 0 0 39.0 3.6 0	<b>lt.</b> pink spleen
10	90		N 0 0 0 2 0 0 0 0 0 40.0 4.3 0	Ich
11	97		N 0 0 0 2 0 0 0 0 0 41.0 4.2 0	Ich, yolk sac
12	90		N 0 0 2 2 0 0 0 0 0 44.0 3.5 0	Ich
13	88		N 0 0 0 2 0 0 0 0 0 40.0 4.2 0	Ich
14	95		N 0 0 1 3 0 0 0 0 0 41.0 4.0 0	

	Length	Weight	Hematocrits	Serum Protein
Average	93.14285	7.428571	41.07142	3.857142
std. Dev.	<b>3.814579</b>	0	2.250850	0.390447
C of v	<b>0.040954</b>	0	0.054803	0.101227
$\times$ Factor	<b>0.000009</b>			
$C$ Factor	0.000332			

	Percent	in	Each	Category			
	N/0	1	2	3	4	5	6
Eyes	100						
Gill	93				7	-	-
Pseudobranch	93	<b>7</b>					
Thymus	57	<b>29</b>	<b>14</b>				
Fat			<b>93</b>	7	-	-	-
Spleen		<b>93</b>			7	-	-
Intestine	<b>100</b>						
Kidney	100						
Liver	100						
Mesentery	100						
Operculum	100						

Hatchery: Spring Creek NFH Date: 04/10/90 Pond Number: 36  
 April Release, Goedes Test

FISH NO.	LN. mm	WT. gm	e g p t f s i k l m h s o												Remarks	
			y i s h a p n i i e e p p	e l b y t l t d v s m r e	s l r m n n n r n a o r											
1	84	96	N 0 0 0 2 0 0 0 0 0 0 39.0 4.6 0												ad	
2	88		N 0 0 0 2 0 0 0 0 0 0												0	hema. & s. pro. lost/broken tubes
3	95		N 0 0 0 2 0 0 0 0 0 0												39.0 4.7	
4	75		N 0 0 0 3 4 0 0 0 0 0												0	fat deposits kidney
5	93		<b>N 0 0 0 2 0 0 0 0 0 0</b>												0	
6	96		N 0 0 0 2 0 0 0 0 0 0												0	ad
7	96		N 0 0 0 2 0 0 0 0 0 0												40.0 5.6	white matter on gill filament
8	85		N 0 0 0 2 0 0 0 0 0 0												41.0 5.2	ad, Ich
9	91		<b>N 0 0 0 2 0 0 0 0 0 0</b>												0	Ich, yolk sac
10	96		N 0 0 0 2 0 0 0 0 0 0												0	Ich
11	99		N 0 0 0 2 0 0 0 0 0 0												0	ad, Ich, yolk sac
12	92		N 0 0 0 2 0 0 0 0 0 0												0	
13	85		N 0 0 0 2 0 0 0 0 0 0												0	Ich, Thymus swollen
14	90		N 0 1 2 2 0 0 0 0 0 0												0	<b>lt.</b> pink spleen

	Length	Weight	Hematocrits	Serum Protein
Average	90.35714	6.857142	39.75	5.025
Std. Dev.	6.217568	0	0.829156	0.402336
c of v	0.068811	0	0.020859	0.080067
K Factor	0.000009			
C Factor	0.000335			

	Percent	in	Each	Category											
	N/O	1	2	3	4	5	6								
Eyes	100		-	-	-	-	-								
Gill	100		-	-	-	-	-								
Pseudobranch	<b>93</b>	7	-	-	-	-	-								
Thymus	<b>93</b>		7	-	-	-	-								
Fat			<b>93</b>	7	-	-	-								
Spleen	<b>93</b>			-	7	-	-								
Intestine	<b>100</b>		-	-	-	-	-								
Kidney	100		-	-	-	-	-								
Liver	100		-	-	-	-	-								
Mesentery	100		-	-	-	-	-								
Operculum	<b>100</b>	-	-	-	-	-	-								

Hatchery: Spring Creek NFH Date: 04/10/90 Pond Number: 37  
 April Release, Goedes Test

FISH NO.	LN. mm	WT. gm	e g p t f s i k l m h s o												Remarks
			y i s h a p n i	i e e	p p	e l b y t l t d v s m r e	s l r m n n n r n a o r								
1	93	104	N	0	1	1	2	0	0	0	0	41.0	4.5	0	
2	89		N	0	1	1	1	0	0	0	0	41.0	4.0	0	
3	<b>94</b>		N	0	0	1	2	0	0	0	0	41.0	4.8	0	
4	<b>101</b>		N	0	0	1	2	4	0	0	0	41.0	4.3	0 ad	
5	<b>85</b>		N	0	0	0	2	0	0	0	0	40.0	4.1	0	
6	<b>90</b>		N	0	0	0	2	0	0	0	0	38.0	3.5	0 ad	
7	<b>86</b>		N	0	0	0	2	0	0	0	0	42.0	4.4	0	
8	<b>95</b>		N	0	0	1	2	0	0	0	0	41.0	4.2	0 Ich	
9	94		N	0	0	2	2	0	0	0	0	44.0	4.4	0	
10	95		N	0	0	1	2	0	0	0	0	43.0	4.9	0 <b>lt.</b> pink hem. spleen	
11	<b>93</b>		N	0	0	0	2	0	0	0	0	44.0	4.2	0 Ich	
12	<b>93</b>		N	0	0	0	2	0	0	0	0	45.0	4.2	0	
13	104		N	0	0	0	2	0	0	0	0	46.0	4.5	0 Ich	
14	84		N	0	0	0	3	0	0	0	0	41.0	3.8	0	

	Length	Weight	Hematocrits	Serum Protein
Average	92.57142	7.428571	42	4.271428
Std. Dev.	5.421047	0	2.070196	0.353409
C of v	0.058560	0	0.049290	0.082737
$\times$ Factor	0.000009			
$C$ Factor	0.000338			

	N/O	Percent in Each Category					
		1	2	3	4	5	6
Eyes	100	-	-	-	-	-	-
Gill	100	-	-	-	-	-	-
Pseudobranch	86	14	-	-	-	-	-
Thymus	50	43	7	-	-	-	-
Fat		7	86	7	-	-	-
Spleen	93	7	-	-	-	-	-
Intestine	100	-	-	-	-	-	-
Kidney	100	-	-	-	-	-	-
Liver	100	-	-	-	-	-	-
Mesentery	100	-	-	-	-	-	-
Operculum	100	-	-	-	-	-	-

Hatchery: Spring Creek NFH Date: 04/10/90 Pond Number: 38  
 April Release, Goedes Test

**FISH LN:** WT. e g p t f s i k l m h s o  
 NO. mm gm y i s h a p n i i e e p p  
 e l b y t l t d v s m r e  
 s l r m n n n r n a 0 r Remarks

1	90	87	N 0 0 0 1 0 0 0 0 0 37.0 4.2 0
2	83		N 0 0 1 2 0 0 0 0 0 42.0 4.7 0
3	93		<b>N 0 0 0 2 0 0 0 0 0 41.0 4.5 0</b>
4	94		N 0 0 0 2 0 0 0 0 0 44.0 4.6 0 excess body fat
5	93		N 0 0 0 2 0 0 0 0 0 46.0 4.1 0
6	82		N 0 0 0 3 0 0 0 0 0 46.0 3.8 0
7	87		N 0 1 0 3 0 0 0 0 0 47.0 4.6 0 ad
8	85		N 4 0 0 2 0 0 0 0 0 45.0 4.3 0 Ich
9	84		N 4 0 0 2 0 0 0 0 0 45.0 4.8 0 yol k sac
10	78		N 0 0 1 3 0 0 0 0 0 47.0 3.6 0 yellow fat
11	97		N 0 0 0 2 0 0 0 0 0 41.0 4.2 0 Ich. yol k sac
12	89		N 0 0 0 3 0 0 0 0 0 48.0 4.5 0 Ich
13	92		N 0 0 0 2 0 0 0 0 0 44.0 4.8 0 yol k sac
14	88		N 0 1 1 3 0 0 0 0 0 50.0 3.9 0 yol k sac

	Length	Weight	Hematocrits	Serum Protein
Average	88.21428	6.214285	44.5	4.328571
Std. Dev.	5.171053	0	3.245876	0.365334
c of v	0.058619	0	0.072941	0.084400
K Factor	0.000009			
C Factor	0.000327			

	Percent	in	Each	Category			
	N/O	1	2	3	4	5	6
<b>Eyes</b>	100						
Gill	86				14	-	-
Pseudobranch	86	14	-	-	-	-	-
Thymus	79	21	-		-		
Fat		7	57	36	-	-	-
Spleen	100						
Intestine	100						
Kidney	100						
Liver	100						
Mesentery	100						
Operculum	100						

Hatchery: Spring Creek NFH Date: 04/10/90 Pond Number: 39  
 April Release, Goedes Test

FISH NO.	LN. mm	WT. gm	e	g	p	t	f	s	i	k	l	m	h	s	o	Remarks
			y	i	s	h	a	p	n	i	i	e	e	p	p	
			s	l	r	m	n	n	n	r	n	a	0	r		
1	96	107	N	0	0	1	2	0	0	0	0	39.0	4.4	0	yellow sac, caseous material /kidney	
2	97		N	0	1	1	2	0	0	0	0	45.0	4.1	0		
3	97		N	0	0	1	2	0	0	0	0	40.0	4.2	0		
4	92		N	0	0	0	2	0	0	0	0	45.0	3.5	0		
5	<b>94</b>		N	0	0	1	2	0	0	0	0	45.0	4.9	0	ad, excess body fat	
6	<b>94</b>		N	5	0	2	2	0	0	0	0	45.0	4.4	0		
7	97		N	0	0	0	2	0	0	0	0	40.0	3.5	0	gills mottled with white spots	
8	100		N	0	0	1	2	0	0	0	0	45.0	4.1	0	Ich	
9	97		N	0	0	0	2	0	0	0	0	43.0	4.6	0	yellow fa	
10	98		N	0	0	1	3	0	0	0	0	43.0	4.0	0		
11	<b>93</b>		N	0	0	0	2	0	0	0	1	45.0	3.8	0	Ich	
12	<b>91</b>		N	0	0	1	2	0	0	0	0	43.0	3.0	0		
13	95		<b>N</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>4</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>44.0</b>	4.0	0		
14	90		N	0	0	1	3	0	0	0	0	42.0	4.3	0	hem. spleen	

	Length	Weight	Hematocrits	Serum Protein
average	95.07142	7.642857	43.14285	4.057142
Std. Dev.	2.763648	0	2.065261	0.473157
% of v	0.029069	0	0.047870	0.116623
< Factor	0.000008			
> Factor	0.000321			

Percent in Each Category							
	N/0	1	2	3	A	<b>5</b>	6
Eyes	100	-	-	-	-	-	-
Gill	93	-	-	-	-	<b>7</b>	-
Pseudobranch	93	7	-	-	-	-	-
Thymus	36	57	7	-	-	-	-
Fat			86	14	-	-	-
Spleen	<b>93</b>	-	-	-	7	-	-
Intestine	<b>100</b>	-	-	-	-	-	-
Kidney	100	-	-	-	-	-	-
Liver	100	-	-	-	-	-	-
Mesentery	93	7	-	-	-	-	-
Operculum	100	-	-	-	-	-	-

Hatchery: Spring Creek NFH Date: 04/10/90 Pond Number: 40  
 April Release, Goedes Test

FISH NO.	LN. mm	WT. gm	e	g	p	t	f	s	i	k	l	m	h	s	o	Remarks
			y	i	s	h	a	p	n	i	i	e	e	p	p	
			e	l	b	y	t	l	t	d	v	s	m	r	e	
			s	l	r	m	n	n	n	r	n	a	o	r		
1	95	98	N	0	0	0	3	4	0	0	0	0	45.0	2.7	0	
2	89		N	0	0	1	3	0	0	0	0	0	38.0	4.1	0	
3	76		N	0	0	0	3	0	0	0	0	0	40.0	4.0	0	lt. pink spleen/black spots
4	81		N	0	0	1	2	0	0	0	0	0	42.0	3.5	0	It. pink spleen/black spots
5	90		N	0	0	0	3	0	0	0	0	0	46.0	2.9	0	
6	93		N	0	0	0	2	0	0	0	0	0	38.0	4.4	0	flesh near anal fin hem.
8	94		N	0	0	2	2	0	0	0	0	1	42.0	3.9	0	Ich, lt. pink spleen/hem.
9	104		N	0	0	0	3	4	0	0	0	0	44.0	3.6	0	excess mes. fat
10	93		N	0	0	0	2	0	0	0	0	0	50.0	2.4	0	
11	90		N	4	0	0	3	0	0	0	0	0	44.0	4.6	0	
12	97		N	0	0	0	2	0	0	0	0	0	46.0	3.8	0	Ich, hem. spleen
13	90		N	0	0	0	2	0	0	0	0	0	45.0	4.2	0	
14	86		N	0	0	2	2	0	0	0	0	0	41.0	4.0	1	fat deposit/kid, small spln/blck s,

	Length	Weight	Hematocrits	Serum Protein
Average	90.64285	7	43.07142	3.792857
Std. Dev.	6.509412	0	3.195181	0.701492
c of v	0.071813	0	0.074183	0.184950
K Factor	0.000009			
C Factor	0.000339			

	Percent in Each Category						
	N/0	1	2	3	4	5	6
Eyes	100						
Gill	93				7	-	-
Pseudobranch	100	-	-	-			
Thymus	64	21	14	-	I	I	-
Fat			50	50	-	-	-
Spleen	79				21	-	-
Intestine	100						
Kidney	100						
Liver	100						
Mesentery	93	7	-	-	-	-	-
Operculum	93	7	-	-	-	-	-

Hatchery: Spring Creek NFH Date: 04/10/90 Pond Number: 41  
 April Release, Goedes Test

FI SH NO.	LN. mm	WT. gm	e y	g i	p s	t h	f a	s p	i n	k i	l e	m e	h p	s r	o e	Remarks
1	90	103	N	0	0	0	2	0	0	0	0	0	37.0	2.7	0	Psbr. hem. vol k sac
2	96		N	0	0	0	2	0	0	0	0	0	38.0	3.7	0	ad
3	90		N	0	0	0	2	4	0	0	0	0	40.0	3.6	0	
<b>5</b>	91		N	0	0	0	2	0	0	0	0	0	40.0	3.6	0	yolk sac
<b>6</b>	94		N	0	0	0	2	0	0	0	0	0	45.0	3.5	0	fat deposits kidney
			N	0	0	0	2	0	0	0	0	0	43.0	4.4	0	
7	<b>94</b>		N	0	0	0	2	0	0	0	0	0	43.0	4.4	0	
8	<b>95</b>		N	0	0	0	2	0	0	0	0	0	37.0	4.0	0	Ich, yolk sac
9	95		N	0	0	0	2	4	0	0	0	0	38.0	3.8	0	Ich
10	103		N	0	0	0	2	0	0	0	0	0	41.0	4.3	0	Ich
11	88		N	0	0	1	2	0	0	0	0	0	39.0	3.8	0	Ich
12	99		N	0	0	0	1	0	0	0	0	0	42.0	4.2	0	Ich
13	96		N	0	0	0	2	0	1	0	0	0	43.0	3.4	0	yellow fat
14	89		N	0	0	0	2	0	0	0	0	0	43.0	3.1	0	

	Length	Weight	Hematocrits	Serum Protein
Average	93.85714	7.357142	40.64285	3.75
Std. Dev.	3.943470	0	2.495915	0.476220
c of v	0.042015	0	0.061410	0.126992
K Factor	0.000008			
C Factor	0.000321			

	Percent	in	Each	Category			
	N/0	1	2	3	4	5	6
Eyes	100	-	-	-	-	-	-
Gill	100	-	-	-	-	-	-
Pseudobranch	100	-	-	-	-	-	-
Thymus	93	7	-	-	-	-	-
Fat		<b>7</b>	93		-	-	-
Spleen	86	-	-	I	<b>14</b>	-	-
Intestine	93	7	-	-	-	-	-
Kidney	100	-	-	-	-	-	-
Liver	100	-	-	-	-	-	-
Mesentery	100	-	-	-	-	-	-
Operculum	100	-	-	-	-	-	-

Hatchery: Spring Creek NFH Date: 04/10/90 Pond Number: 42  
 April Release, Goedes Test

FI SH NO.	LN. mm	WT. gm	e	g	p	t	f	s	i	k	l	m	h	s	o	Remarks
			y	i	s	h	a	p	n	i	i	e	e	p	p	
			e	l	b	y	t	l	t	d	v	s	m	r	e	
			s	l	r	m	n	n	n	r	n	a	o	r	Remarks	
1	93	97	N	0	0	0	2	0	0	0	0	39.0	3.7	0	black spots spleen, yolk sac	
2	103		N	0	0	0	2	0	0	0	1	39.0	4.4	0		
3	98		N	0	0	1	2	0	0	0	0	43.0	1.4	0		
4	95		N	0	0	0	2	0	0	0	0	37.0	4.0	0	very small spl n/black spots/hem.	
5	96		N	0	0	0	2	4	0	0	0	38.0	3.2	0	hem. spleen, excess mes. fat	
6	94		N	0	0	2	2	0	0	0	0	41.0	3.6	0		
7	94		N	0	0	0	3	0	0	0	0	38.0	4.3	0	small spleen/black spots/lt. pink	
8	90		N	0	0	1	3	0	0	0	0	38.0	4.3	0		
9	92		N	0	4	1	3	0	0	0	0	39.0	3.1	0	Ich, yolk sac, spl n/lt pink/black	sf
10	90		N	0	0	0	3	0	0	0	0	41.0	6.1	0	ad	
11	97		N	0	0	0	3	0	0	0	0	43.0	4.5	0	yolk sac	
12	84		N	0	0	0	3	0	0	0	0	43.0	3.2	0		
13	91		N	0	0	1	3	0	0	0	0	46.0	4.6	0		
14	87		N	0	0	0	2	0	0	0	0	41.0	4.3	0	Ich	

	Length	Weight	Hematocrits	Serum Protein
Average	93. 14285	6.920571	40. 42857	3. 907142
Std. Dev.	4. 595916	0	2. 496979	1. 015215
c of v	0. 049342	0	0. 061812	0. 259835
K Factor	0. 000008			
C Factor	0. 000309			

	Percent	in	Each	Category				
	N/0	1	2	3	4	5	6	
Eyes	100							
Gill	100							
Pseudobranch	93							
Thymus	64	29	7	-	7	-	-	
Fat			50	50	-	-	-	
Spleen	93				7			
Intestine	100							
Kidney	100							
Liver	100							
Mesentery	100							
Operculum	100							

Hatchery: Spring Creek NFH Date: 04/10/90 Pond Number: 43  
 April Release, Goedes Test

FI SH NO.	LN. mm	WT. gm	e	g	p	t	f	s	i	k	l	m	h	s	o	Remarks
			y	i	s	h	a	p	n	i	e	e	p	p		
			e	l	b	y	t	l	t	d	v	s	m	r	e	
			s	l	r	m	n	n	n	r	n	a	0	r		
1	95	107	N	0	0	0	2	4	0	0	0	0	40.0	3.5	0	
2	92		N	0	0	0	2	0	0	0	0	0	38.0	3.9	0	slight hem. on underside <b>of operc.</b>
3	102		N	0	1	1	2	0	0	0	0	0	39.0	3.6	0	hem. spleen
4	97		N	0	0	0	2	0	0	0	0	0	36.0	3.0	0	
5	96		N	0	0	0	2	0	0	0	0	0	38.0	4.0	0	
6	89		N	0	0	0	2	0	0	0	0	0	27.0	3.2	0	black spots spleen, yolk <b>sac</b>
7	99		N	0	0	1	2	4	0	0	0	0	42.0	3.6	0	
8	92		N	0	0	0	3	0	0	0	0	0	45.0	4.6	0	Ich, black spots spleen
9	98		N	0	0	1	2	0	0	0	0	0	37.0	3.5	0	
10	91		N	0	0	0	2	0	0	0	0	0	41.0	4.2	0	
11	95		N	0	0	0	2	0	0	0	0	0	41.0	4.2	0	Ich, black spots spleen
12	95		N	0	0	0	2	0	0	0	0	0	41.0	3.8	0	
13	96		N	0	0	0	2	0	0	0	0	0	43.0	4.2	0	Ich, yolk <b>sac</b>
14	94		N	0	0	0	3	0	0	0	0	0	43.0	4.3	0	ad

	Length	Weight	Hematocrits	Serum Protein
Average	95.07142	7.642857	39.35714	3.828571
Std. Dev.	3.283384	0	4.202161	0.436591
c of V	0.034535	0	0.106769	0.114035
K Factor	0.000008			
C Factor	0.000321			

	N/0	Percent in Each Category					
		1	2	3	4	5	6
Eyes	100						
Gill	100						
Pseudobranch	93	7	-	:	-	-	-
<b>Thymus</b>	79	21	-	-	-	-	-
Fat		86	14		-	-	-
Spleen	86			14	-	-	-
Intestine	100						
Kidney	100						
Liver	100						
Mesentery	100						
Operculum	100						

Hatchery: Spring Creek NFH Date: 04/10/90 Pond Number: 44  
 April Release, Goedes Test

FI SH NO.	LN. mm	WT. gm	e g p t f s i k l m h s o												Remarks
			y i s h a p n i i e e p p	e l b y t l t d v s m r e	s l r m n n n r n a o r										
1	96	95	N	0	0	0	3	4	0	0	0	0	47.0	3.2	0
2	91		N	0	0	1	3	0	0	0	0	0	45.0	5.5	0
3	90		Ml	0	0	0	2	0	1	0	0	0	41.0	1.2	0
4	92		N	0	0	0	3	0	0	0	0	0	43.0	3.8	0
5	95		N	0	0	0	2	0	0	0	0	0	42.0	2.9	0
6	99		N	0	0	0	2	0	0	0	0	0	47.0	3.7	0
7	88		N	0	0	0	3	0	0	0	0	0	46.0	3.0	0
8	94		N	0	0	0	2	0	0	0	0	0	44.0	2.4	0
9	85		N	4	0	0	3	0	0	0	0	0	42.0	3.6	0
10	94		N	0	0	0	2	0	0	0	0	0	46.0	4.3	0
11	90		N	0	0	0	2	0	0	0	0	0	47.0	4.0	0
12	90		N	0	1	1	3	4	0	0	0	0	43.0	4.3	0
13	86		N	0	0	0	3	0	0	0	0	0	47.0	3.2	0
14	94		N	0	0	1	2	0	0	0	0	0	44.0	4.0	0

	Length	Weight	Hematocrits	Serum Protein
Average	91.71428	6.785714	44.57142	3.507142
Std. Dev.	3.768830	0	2.060315	0.971349
c of v	0.041093	0	0.046225	0.276963
K Factor	0.000008			
C Factor	0.000317			

		Percent	in	Each	Category			
	N/O	1	2	3	4	5	6	
Eyes	93	7(M1)	-	-	-	-	-	-
Gill	93	-	-	-	7	-	-	-
Pseudobranch	93	7	-	-	-	-	-	-
Thymus	79	21	-	-	-	-	-	-
Fat			50	50	-	-	-	-
Spleen	86				14	-	-	-
Intestine	93	7	-	-	-	-	-	-
Kidney	100							
Liver	100							
Mesentery	100							
Operculum	100							

atchery: Spring Creek NFH Date: 5/14/90 Pond No: 1  
ode: 5-16-33 May Release Sample Size: 8

		e	g	p	t	f	s	i	k	l	m	h	s	o	
ish	Ln.	y	i	s	h	a	p	n	i	i	e	e	p	p	
no.	mm	Wt.	e	l	b	y	t	l	t	d	v	s	m	r	e
		gm	s	l	r	m	n	n	n	r	n	a	o	r	Remarks
1	115	79	N	0	0	2	2	4	0	0	0	0	43.0	4.7	0
2	106		N	0	0	0	2	0	0	0	0	0	41.0	4.3	0 Ich, yolk sac
3	92		N	0	0	0	0	0	0	0	0	0	38.0	3.8	0 Ich
4	108		N	0	0	0	1	0	0	0	0	0	41.0	4.1	0 necrotic tissue gills, fat deposit/kid
5	104		N	0	1	1	2	0	0	0	0	0	42.0	4.0	0
5	99		N	0	0	1	2	0	0	0	0	0	38.0	3.6	0 nec. tis. gills
7	101		N	0	0	0	1	0	0	0	0	0	40.0	4.3	0 nec. tis. gills, yellow fat/pyloric
3	101		N	0	1	0	2	0	0	0	0	0	44.0	4.5	0 ad

eyes	=	eyes	ki dn	=	ki dney
gill	=	gills	livr	=	li ver
psbr	=	pseudobranch	mesn	=	mesentery
thym	=	thymus	hema	=	hematocrit
fat	=	fat (pyloric caeca)	spro	=	serum protein
spln	=	spleen	oper	=	operculum
intn	=	intestine			

Percent in Each Category

N/O	1	2	3	4	5	6
-----	---	---	---	---	---	---

yes	100					
ill	100	-				
pseudobranch	7.5	25				
thymus	62.5	25	12.5			
fat	12.5	25	62.5			
spleen	87.5	-			12.5	
intestine	100					
kidney	100	-				
li ver	100					
mesentery	100	-				
operculum	100	-				

	Length	Weight	Hematocrits	Serum	Protein
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verage	103.25	9.875	40.875	4.1625	
:d. Dev.	6.359048	0	2.027159	0.338886	
of v	0.061588	0	0.049594	0.081414	
Factor	0.000008				
Factor	0.000324				

atchery: Spring Creek NFH Date: 5/14/90 Pond No: 2  
ode: 5-16-27 May Release Sample Size: 8

ish no.	Ln.	Wt. mm	e l s l r m	e g p t f s i k l m h s o										Remarks
				y i s h a p n i i e e p p	b y t l t d v s m r e	n n n r n a o r								
1		103	82	N 0 1 1 1 4 0 0 0 0 43.0 4.6 0	<b>nec.</b>	tis.	gills							
2		100		N 0 0 0 2 0 0 0 0 0 38.0 3.8 0	<b>nec.</b>	tis.	gills							
3		101		N 0 1 0 2 0 0 0 0 0 39.0 3.9 0										
4		110		N 0 0 0 1 0 0 0 0 0 41.0 4.3 0	<b>nec.</b>	tis.	gills							
5		109		N 0 0 1 1 0 0 0 0 0 40.0 4.5 0	<b>nec.</b>	tis.	gills							
6		104		N 0 0 0 2 0 0 0 0 0 41.0 4.0 0	<b>nec.</b>	tis.	gills							
7		94		N 0 0 0 2 0 0 0 0 0 40.0 4.2 0	Ich,	<b>nec.</b>	tis.	gills						
8		105		N 0 0 2 3 0 0 0 0 0 43.0 4.4 0	<b>nec.</b>	tis.	<b>gills, excess body fat</b>							

eyes	= eyes	kidn	= kidney
gill	= gills	livr	= liver
psbr	= pseudobranch	mesn	= mesentery
thym	= thymus	<b>hema</b>	= hematocrit
fat	= fat ( <b>pyloric caeca</b> )	spro	= serum protein
spln	= spleen	oper	= operculum
intn	= intestine		

	Percent	in	Each	Category				
	N/O	1	2	3	4	5	6	
<b>yes</b>	100	-	-					
<b>ill</b>	100		-					
<b>seudobranch</b>	75	25	-					
<b>hymus</b>	62.5	25	12.5					
<b>at</b>		37.5	50	12.5	-			
<b>pleen</b>	87.5	-			12.5			
<b>ntestine</b>	100	-						
<b>idney</b>	100							
<b>iver</b>	100	-						
<b>esentery</b>	100	-						
<b>perculum</b>	100	-						

	Length	Weight	Hematocrits	Serum	Protein
<b>verage</b>	103.25	10.25	40.625	4.2125	
<b>td. Dev.</b>	' 4.789311	0	1.653594	0.271281	
<b>of v</b>	0.046385	0	0.040703	0.064399	
<b>Factor</b>	0.000009				
<b>Factor</b>	0.000336				

atcnery: Spring Creek NFH Date: 5/14/90 Pond No: 3  
ode: 5-16-31 May Release Sample Size: 8

ish Ln. no.	Wt. mm	e g p t s l r m	f s i k l m y i s h a p n i i e e 1 b y t l t d v s n n n r n	h s o e p p m r e a 0 r	Remarks	
					Remarks	
105	76	N 0 1 0 2 0 0 0 0 0	36.0	3.9 0	<b>nec.</b> tis. gills, yolk sac, blk spots	sp!
102		N 0 0 1 2 0 0 0 0 0	39.0	3.6 0	<b>nec.</b> tis. gills	
103		N 4 1 1 2 0 0 0 0 0	40.0	3.0 0	lt. pink spleen	
97		N 0 0 0 1 0 0 0 0 0	37.0	3.5 0		
100		N 0 0 0 1 0 0 0 0 0	39.0	3.3 0	Ich, excess body fat	
107		N 0 1 0 2 4 0 0 0 0	43.0	4.1 0	ad, yolk sac, excess body fat	
104		N 0 0 0 3 0 0 0 0 0	41.0	4.0 0	Ich, <b>nec.</b> tis. gills	
107		N 0 1 1 2 0 0 0 0 0	36.0	3.2 0	Ich, <b>nec.</b> tis. gills	

eyes	=	eyes	kidn	=	kidney
gill	=	gills	livr	=	liver
psbr	=	pseudobranch	mesn	=	mesentery
thym	=	thymus	hema	=	hematocrit
fat	=	fat (pyloric <b>caeca</b> )	spro	=	serum protein
splen	=	spleen	oper	=	operculum
intn	=	intestine			

#### Percent in Each Category

	N/O	1	2	3	4	5	6
<b>yes</b>	100						
ill	87.5	-	-		12.5		
seudobranch	50	50					
hymus	62.5	37.5	-				
at		25	62.5	12.5			
<b>spleen</b>	87.5			12.5			
<b>ntestine</b>	100						
<b>idney</b>	100	-					
<b>iver</b>	100	-					
<b>esentery</b>	100	-					
<b>perculum</b>	100	-					

	Length	Weight	Hematocrits	Serum	Protein
<b>verage</b>	103.125	9.5	38.875	3.575	
td. Dev.	' 3.218598	0	2.315032	0.373329	
of v	0.031210	0	0.059550	0.104427	
Factor	0.000008				
Factor	0.000312				

atchery: Spring Creek NFH Date: 5/14/90 Pond No: 4  
ode: 5-16-29 May Release Sample Size: 8

			e	g	p	t	f	s	i	k	l	m	h	s	o
ish	Ln.	Wt.	y	i	s	h	a	p	n	i	e	e	e	p	p
no.	mm	gm	e	l	b	y	t	l	t	d	v	s	m	r	e
1	104	84	N	0	1	0	1	0	0	0	0	0	33.0	2.4	0
2	106		N	0	1	1	2	0	0	0	0	0	36.0	4.3	0
3	103		N	0	1	1	1	0	0	0	0	0	41.0	4.0	0
4	107		N	0	0	1	2	1	0	0	0	0	37.0	2.4	0
5	106		N	0	1	0	2	0	0	0	0	0	39.0	3.8	0
6	97		N	0	0	0	1	3	0	0	0	0	42.0	2.5	0
7	104		N	0	0	0	2	0	0	0	0	0	40.0	4.3	0
8	108		N	0	0	0	3	0	0	0	0	0	37.0	4.1	0

eyes	=	eyes	kidn	=	kidney
gill	=	gills	livr	=	liver
psbr	=	pseudobranch	mesn	=	mesentery
thym	=	thymus	hema	=	hematocrit
fat	=	fat ( <b>pyloric caeca</b> )	spro	□	serum protein
sp	=	spleen	oper	=	<b>operculum</b>
intn	=	intestine			

	Percent	in	Each	Category				
	N/0	1	2	3	4	5	6	
<b>yes</b>	100	-	-					
<b>ill</b>	100	-	-					
<b>seudobranch</b>	50	50						
<b>hymus</b>	62.5	37.5	*					
<b>at</b>	-	37.5	50	12.5	*			
<b>pleen</b>	75	12.5	-	12.5	-			
<b>ntestine</b>	100	-	-					
<b>idney</b>	100	-	-					
<b>iver</b>	100	-	-					
<b>esentery</b>	100	-	-					
<b>perculum</b>	100	-	-					

	Length	Weight	Hematocrits	Serum	Protein
<b>verage</b>	104.375	10.5	38.125	3.475	
<b>td. Dev.</b>	3.199120	0	2.758509	0.821203	
: of v	0.030650	0	0.072354	0.236317	
: Factor	0.000009				
: Factor	0.000333				

atchery: Spring Creek NFH Date: 5/14/90 Pond No: 5  
ode: 5-16-32 May Release Sample Size: 8

		e	g	p	t	f	s	i	k	l	m	h	s	o	
ish	Ln.	Wt.	y	i	s	h	a	p	n	i	e	e	p	p	
no.	mm	gm	s	l	r	m	n	n	n	r	n	a	0	r	Remarks
1	105	83	N	0	0	0	3	4	0	0	0	0	42.0	3.6	0 nec. tis. gills
2	102	11	N	0	0	1	2	0	0	0	0	0	42.0	3.8	0 nec. tis. gills, fat on kd
3	105		N	0	1	0	3	0	0	0	0	0	41.0	3.9	0 ad
5	106		N	0	0	0	2	0	0	0	0	0	42.0	4.2	0
6	103		N	0	0	0	3	4	0	0	0	0	39.0	3.3	0 Inc yolk sak
7	110		N	0	0	0	2	4	0	0	0	0	43.0	3.2	0 Inch nec. tis. gills
8	105		N	0	1	1	2	0	0	0	0	0	42.0	3.0	0 Inch, nec. tis. gills, fat on thym

eyes	=	eyes	ki dn	=	kidney
gill	=	gills	li vr	=	liver
psbr	=	pseudobranch	mesn	=	mesentery
thym	=	thymus	hema	=	hematocrit
fat	=	fat ( <b>pyloric</b> caeca)	spro	=	serum protein
spl n	=	spleen	oper	=	operculum
int n	=	intestine			

	Percent		in	Each	Category		
	N / 0	1	2	3	4	5	6
yes	100	-	-				
ill	07. 5	-	-				12. 5
seudobranch	62. 5	37. 5	-				
hymus	62. 5	37. 5	-				
at			50	50			
pleen	62. 5	-		37. 5	-		
nt est ine	100	-					
idney	100	-					
iver	100	-					
esent ery	100	-					
percul um	100	-					

	length	Weight	Hematocrits	Serum	Protein
verage	105. 25	10. 375	41. 5		3. 6375
td. Dev.	2. 222048	0	1. 118033		0. 311999
of v	0. 021112	0	0. 026940		0. 085773
Factor	0. 000008				
Factor	0. 000321				

atchery: Spring Creek NFH Date: 5/14/90 Pond No: 6  
ode: 5-16-30 May Release Sample Size: 8

fish no.	Ln. mm	Wt. gm	e g p t f s i k l m h s 0												Remarks
			y i s h a n i e p e P P	e l b y t t d v s m l r e	0										
1	107	83	N 0	1 0 2 0 0 0 0 0 41.0 4.1 0	nec.	tis.	gill	ls							
2	101		N 0	1 0 2 0 0 0 0 0 40.0 4.3 0	nec.	tis.	gill	ls							
3	100		N 0	1 0 2 0 0 0 0 0 45.0 3.8 0	nec.	tis.	gill	ls	yolk sac,	fat on	thy				
4	108		N 5	1 2' 2 0 0 0 0 0 45.0 3.7 0											
5	99		N 5	1 1 2 0 0 0 0 0 37.0 3.8 0	Ich,	nec.	tis.	gills							
6	106		N 0	0 1 2 4 0 0 0 0 46.0 4.4 0	Ich,	nec.	tis.	gills		fat on	thym				
7	105		N 0	0 0 2 0 0 0 0 0 44.0 4.2 0	nec.	tissue	gills								
8	104		N 5	0 0 3 0 0 0 0 0 43.0 4.3 0	Ich,	nec.	tis./pale	gills		fat	thym				

eyes	=	eyes	ki dn	=	ki dney
gill	=	gills	livr	=	li ver
psbr	=	pseudobranch	mesn	=	mesentery
thym	=	thymus	hema	=	hematocrit
fat	=	fat (pyloric caeca)	spro	=	serum protein
spl n	=	spleen	oper	=	operculum
intn	=	intestine			

	Percent	in	Each	Category		
	N/O	1	2	3	4	5
eyes	100	-	-			
gill	62.5	-	-		37.5	-
pseudobranch	37.5	62.5	-			
thymus	62.5	25	12.5			
fat			87.5	12.5	-	
spleen	87.5	-		12.5		
intestine	100					
kidney	100					
liver	100					
mesentery	100					
operculum	100	-				

	Length	Weight	Hematocrits	Serum	Protein
average	103.75	10.375	42.625		4.075
std. Dev.	3.152380	0	2.869560		0.253722
% of v	0.030384	0	0.067321		0.062263
K Factor	0.000009				
C Factor	0.000335				

atchery: Spring Creek NFH Date: 5/14/90 Pond No: 7  
ode: 5-16-28 May Release Sample Size: 8

ish no.	Ln. mm	Wt. g	e g p t f s i k l m h s o										Remarks
			y i s h a p n i i e e p p	e l b y t l t d v s m r e	s l r m n n n r n a o r								
1 106	90	N 0 1 0 2 0 0 0 0 0 39.0 4.1 0	<b>nec.</b> tis. gills										
2 104		N 0 1 0 2 0 0 0 0 0 39.0 3.7 0	<b>nec.</b> tis. gills										
3 108		N 0 0 0 2 4 0 0 0 0 42.0 3.8 0	<b>nec.</b> tis. gills, yolk sac										
4 104		N 0 1 0 2 0 0 0 0 0 42.0 4.3 0	<b>nec.</b> tis. gills										
5 108		N 0 0 2 3 0 0 0 0 0 43.0 4.4 0	fat on kid, excess body fat										
7 112		N 0 1 1 2 0 0 0 0 0 41.0 4.2 0	Ich, <b>nec.</b> tis. gills, fat on kid										
8 104		N 0 1 0 3 0 0 0 0 0 40.0 3.7 0	Ich, nec. tis. gills										

eyes	=	eyes	kidn	=	kidney
gill	=	gills	livr	=	liver
psbr	=	pseudobranch	mesn	=	mesentery
thym	=	thymus	<b>hema</b>	=	hematocrit
fat	=	fat ( <b>pyloric caeca</b> )	spro	=	serum protein
spln	=	spleen	<b>oper</b>	=	<b>operculum</b>
intn	=	intestine			

	Percent	in	Each	Category				
	N/O	1	2	3	4	5	6	
<b>yes</b>	100	-	-					
ill	100	-	-					
seudobranch	37.5	62.5	-					
hymus	75	12.5	12.5					
at			75	25				
pleen	87.5	-			12.5			
ntestine	100	-						
idney	100							
<b>iver</b>	100							
esentery	100							
<b>perculum</b>	100							

	Length	Weight	Hematocrits	Serum	Protein
<b>verage</b>	107.25	11.25	41.125		4.0375
td. Dev.	' 3.152380	0	1.536025		0.254644
of v	0.029392	0	0.037350		0.063069
Factor	0.000009				
Factor	0.000329				

atchery: Spring Creek NFH Date: 5/14/90 Pond No: 8  
ode: 5-16-26 May Release Sample Size: 8

		e	g	p	t	f	s	i	k	l	m	h	s	o	
ish	Ln.	y	i	s	h	a	p	n	i	e	e	p	p		
no.	Ln.	Wt.	el	by	tl	t	d	vs	m	r	r	e	r	Remarks	
		mm	gm	s	l	r	m	n	n	n	n	a	o	r	
1	109	102	N	0	1	1	1	0	0	0	0	41.0	4.5	0	
2	111		N	0	0	1	2	4	0	0	0	40.0	3.3	0	
3	119		N	0	1	1	2	0	0	0	0	41.0	4.7	0	
4	116		N	0	1	0	2	0	0	0	0	44.0	4.3	0	
5	110		N	0	1	1	2	0	0	0	0	43.0	4.4	0	
6	114		N	0	0	1	3	0	0	0	0	40.0	4.0	0	
7	108		N	5	0	1	2	0	0	0	0	41.0	3.8	0	
8	106		N	0	0	0	2	0	0	0	0	44.0	4.6	0	
														Ich, nec. tis. gills	
														tan fat/Pyloric	

eyes	=	eyes	kidn	=	kidney
gill	=	gills	livr	=	liver
psbr	=	pseudobranch	mesn	=	mesentery
thym	=	thymus	<b>hema</b>	=	hematocrit
fat	=	fat ( <b>pyloric caeca</b> )	spro	=	serum protein
<b>spn</b>	=	spleen	oper	=	operculum
intn	=	intestine			

Percent in Each Category

	N/O	1	2	3	4	5	6
<b>yes</b>	100	-	-				
ill	87.5	-	-			12.5	-
seudobranch	50	50	-				
hymus	25	75	-				
at		12.5	75	12.5	-		
pleen	87.5	-			12.5		
ntestine	100						
idney	100	-					
iver	100	-					
esentery	100	-					
perculum	100	-					

	Length	Weight	Hematocrits	Serum	Protein
<b>verage</b>	111.625	12.75	41.75		4.2
td. Dev.	' 4.090767	0	1.561249	0.441588	
of v	0.036647	0	0.037395	0.105140	
Factor	0.000009				
Factor	0.000331				

Hatchery: Spring Creek NFH Date: 5/14/90 Pond No: 9  
 Code: 5-22-15 May Release Sample Size: 8

fish no.	Ln. mm	Wt. gm	e g p t f s i k l m h s o											Remarks
			y i s h a p n i e e p p	e l b y t l t d v s m r e	n n n r n a	0	r							
1	111	107	N 0 1 1 2 0 0 0 0 0 38.0	4.8 0	<b>nec.</b>	tis.	gills,	excess	body	fat				
2	116	N 0 1 1 2 0 0 0 0 0 37.0	4.0 0	<b>nec.</b>	tis.	gills,	excess	body	fat					
3	110	N 0 1 2 2 0 0 0 0 0 40.0	4.0 0	<b>nec.</b>	tis.	gills,	excess	body	fat					
4	109	N 0 1 1 2 0 0 0 0 0 42.0	4.3 0	<b>nec.</b>	tis.	gills,	excess	body	fat					
5	111	N 0 0 1 2 0 0 0 0 0 38.0	4.3 0	Ich,	<b>nec.</b>	tis.	gills,	petechial	<b>hem/Per</b>					
6	120	N 0 1 0 2 0 0 0 0 0 37.0	4.6 0	Ich,	<b>nec.</b>	tis.	gills							
7	105	N 0 1 1 2 0 0 0 0 0 41.0	5.1 0	Ich,	<b>nec.</b>	tis.	gills,	excess	body	<b>fat</b>				
8	110	N 0 1 1 3 0 0 0 0 0 35.0	3.7 0	Ich,	<b>nec.</b>	tis.	gills							

eyes	=	eyes	ki dn	=	kidney
gill	=	gills	livr	=	liver
psbr	=	pseudobranch	mesn	=	mesentery
thym	=	thymus	<b>hema</b>	=	hematocrit
fat	=	fat ( <b>pyloric caeca</b> )	spro	=	serum protein
<b>sp1n</b>	=	spleen	<b>oper</b>	=	<b>operculum</b>
intn	=	intestine			

Percent in Each Category

	N/0	1	2	3	4	5	6
Eyes	100	-	-				
Gill	100						
Pseudobranch	12.5	87.5	-				
Thymus	12.5	75	12.5				
Fat			87.5	12.5	-		
Spleen	100						
Intestine	100	-					
Kidney	100	-					
Liver	100	-					
Mesentery	100						
Operculum	100						

	Length	Weight	Hematocrits	Serum	Protein
Average	111.5	13.375	38.5	4.35	
Std. Dev.	4.272001	0	2.179449	0.433012	
C of V	0.038313	0	0.056609	0.099543	
C Factor	0.000009				
C Factor	0.000348				

atchery: Spring Creek NFH Date: 5/14/90 Pond No: 10  
ode: 5-22-15 May Release Sample Size: 8

		e	g	p	t	f	s	i	k	l	m	h	s	o
ish	Ln.	y	i	s	h	a	p	n	i	i	e	e	p	p
no.	mm	Wt.	el	b	y	t	l	t	d	v	s	m	r	e
		gm	s	l	r	m	n	n	n	r	n	a	0	r

1	111	92	N	0	1	1	3	4	0	0	<b>0</b>	40.0	4.3	0
2	105		N	0	1	1	2	0	0	0	0	39.0	4.2	0
3	109		N	0	1	1	1	0	0	0	0	39.0	4.6	0
4	109		N	0	0	0	2	0	0	0	0	41.0	4.3	0
5	96		N	0	0	1	2	0	0	0	0	37.0	3.3	0
6	108		N	0	<b>1</b>	1	2	0	0	0	0	39.0	4.3	0
7	106		N	0	0	0	2	0	0	0	0	40.0	4.2	0
8	107		N	0	2	<b>0</b>	<b>3</b>	0	0	0	0	41.0	4.4	0

eyes	=	eyes	ki dn	=	kidney
gill	=	gills	livr	=	liver
psbr	=	pseudobranch	mesn	=	mesentery
thym	=	thymus	<b>hema</b>	=	hematocrit
fat	=	fat ( <i>pyloric caeca</i> )	spro	=	serum protein
<b>sp</b> l	=	spleen	<b>oper</b>	=	operculum
intn	=	intestine			

	Percent	in	Each	Category			
	N/0		1	2	3	4	5
<b>yes</b>	100		"	"			
<b>ill</b>	100		-	-			
<b>seudobranch</b>	37.5	50		12.5			
<b>hymus</b>	37.5	62.5		"			
<b>at</b>		12.5	62.5	25			
<b>pl</b> een	87.5	-			12.5		
<b>ntestine</b>	100	-					
<b>idney</b>	100	-					
<b>iver</b>	100	-					
<b>esentery</b>	100						
<b>percolum</b>	100						

	Length	Weight	Hematocrits	Serum	Protein
<b>verage</b>	106.375	11.5	39.5		4.2
<b>td. Dev.</b>	4.299345	0	1.224744	0.360555	
<b>of V</b>	0.040416	0	0.031006	0.085846	
<b>Factor</b>	0.000009				
<b>Factor</b>	0.000345				

Hatchery: Spring Creek NFH Date: 5/14/90 Pond No: 11  
 Code: 5-22-15 May Release Sample Size: 8

fish no.	Ln. mm	Wt. gm	e g p t f s i k l m h s o												Remarks
			s l	r m	e l b y t l t d v s n n n r n a	m	r	p	p	0	r	0	e		
1	106	101	N 0 0 1 2 4 0 0 0 0	37.0	4.0	0									
2	114		N 0 1 0 2 0 0 0 0 0	41.0	4.3	0									
3	111		N 0 1 1 2 0 0 0 0 0	43.0	4.8	1	<b>nec.</b>	tis.	gills,	fat	on	kid			
4	119		N 0 1 1 2 0 0 0 0 0	40.0	4.4	0									
5	<b>104</b>		N 0 1 0 2 0 0 0 0 0	36.0	4.2	0	Ich								
6	<b>110</b>		N 0 0 1 2 4 0 0 0 0	38.0	3.6	0	Ich	excess fat	on pyloric						
7	104		N 0 0 1 3 0 0 0 0 0	38.0	3.9	0	Ich								
8	110		N 0 0 0 3 4 0 0 0 0	45.0	4.2	0	Ich, <b>nec.</b>	tis.	gills						

eyes	= eyes	ki dn	= ki dney
gill	= gills	livr	= liver
psbr	= pseudobranch	<b>mesn</b>	= mesentery
thym	= thymus	<b>hema</b>	= hematocrit
fat	= fat ( <b>pyloric caeca</b> )	spro	= serum protein
spln	= spleen	oper	= operculum
intn	= intestine		

Percent in Each Category

	N/O	1	2	3	4	5	6
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Eyes	100	-					
Gill	100						
Pseudobranch	50	50					
Thymus	37.5	62.5					
Fat			75	25	-		
Spleen	62.5	-			37.5		
Intestine	100	-					
Kidney	100	-					
Liver	100	-					
Mesentery	100	-					
Operculum	87.5	12.5					

	Length	Weight	Hematocrits	Serum	Protein
Average	109.75	<b>12.625</b>	39.75	4.175	
Std. Dev.	4.815340	0	<b>2.904737</b>	0.334477	
C of V	0.043875	0	0.073075	<b>0.080114</b>	
C Factor	0.000009				
C Factor	0.000345				

atchery: Spring Creek NFH Date: 5/14/90 Pond No: 12  
ode: 5-22-15 May Release Sample Size: 8

		e	g	p	t	f	s	i	k	l	m	h	s	o		
		y	i	s	h	a	p	n	i	e	e	p	p			
ish	Ln.	Wt.	e	l	b	y	t	l	t	d	v	s	m	r		
no.	mm	gm	<b>s</b>	<b>1</b>	<b>r</b>	<b>m</b>	<b>n</b>	<b>n</b>	<b>n</b>	<b>r</b>	<b>n</b>	<b>a</b>	<b>0</b>	<b>r</b>	Remarks	
1	114	105	N	O	1	0	2	4	0	0	0	0	42.0	4.1	0	nec. tis. gills
2		108	N	O	0	0	0	2	0	0	0	0	34.0	3.9	0	yolk sac
3		105	N	O	0	0	1	0	0	0	0	0	38.0	3.7	0	
4		112	N	O	1	0	2	0	0	0	0	0	44.0	4.9	0	nec. yolk sac
5		108	N	O	0	1	3	0	0	0	0	0	38.0	3.8	0	Ich
6		119	N	O	1	2	2	0	0	0	0	0	45.0	5.1	0	<b>nec.</b> tis. gills
7		119	N	5	0	0	3	0	0	0	0	0	43.0	4.5	0	<b>nec.</b> tis. gills
8		113	N	O	0	1	1	0	0	0	0	0	42.0	3.8	0	Ich

eyes	=	eyes	ki dn	=	ki dney
gill	=	gills	livr	=	liver
psbr	=	pseudobranch	<b>mesn</b>	=	mesentery
thym	=	thymus	<b>hema</b>	=	hematocrit
fat	=	fat ( <b>pyloric caeca</b> )	spro	=	serum protein
spln	=	spleen	oper	=	operculum
intn	=	intestine			

	Percent	in	Each	Category			
	N/O	1	2	3	4	5	6
<b>yes</b>	<b>100</b>	-	-				
ill	87.5	-	-			12.5	-
seudobranch	62.5	37.5	-				
hymus	62.5	25	12.5				
at		25	50	25	-		
<b>pleen</b>	87.5	-			12.5		
ntestine	100	-					
idney	100	-					
iver	100	-					
<b>esentery</b>	100	-					
perculum	100	-					

	Length	Weight	Hematocrits	Serum	Protein
verage	112.25	13.125	40.75	4.225	
td. Dev.	' 4.789311	0	3.491060	0.506828	
of V	0.042666	0	0.085670	0.119959	
Factor	0.000009				
Factor	0.000335				

atchery: Spring Creek NFH Date: 5/14/90 Pond No: 13  
 Mode: 5-22-15 May Release Sample Size: 8

		e	g	p	t	f	s	i	k	l	m	h	s	<b>O</b>	
ish Ln.	Wt.	y	i	s	h	a	p	n	i	e	e	p	p		
10.	mm	e	l	b	y	t	l	t	d	v	s	m	r	e	Remarks
1	115	100	N	0	1	1	2	0	0	0	'0	36.0	3.5	0	<b>nec.</b> tis. gills
2	114		N	0	1	2	2	0	0	0	0	41.0	5.1	0	<b>nec.</b> tis. gills, excess body fat
3	106		N	0	0	0	2	0	0	0	0	35.0	4.2	0	<b>nec.</b> tis. gills, excess body fat
4	98		N	0	1	1	2	0	0	0	0	46.0	3.3	0	<b>nec.</b> tis. gills
5	110		N	0	1	0	2	0	0	0	0	43.0	4.1	0	Ich, <b>nec.</b> tis. gills
6	111		N	0	0	2	2	0	0	0	0	42.0	4.2	0	Ich, <b>nec.</b> tis. gills
7	109		N	0	0	1	2	0	0	0	0	41.0	4.6	0	Ich, <b>nec.</b> tis. gills
8	111		N	0	1	0	2	0	0	0	0	42.0	4.2	0	Ich, <b>nec.</b> tis. gills

eyes	=	eyes	kidn	=	kidney
gill	=	gills	livr	=	liver
psbr	=	pseudobranch	mesn	=	mesentery
thym	=	thymus	hema	=	hematocrit
fat	=	fat (pyloric <b>caeca</b> )	spro	=	serum protein
<b>spln</b>	=	<b>spleen</b>	<b>oper</b>	=	<b>operculum</b>
intn	=	intestine			

	Percent	in	Each	Category
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N/O	1	2	3	4	5	6
-----	---	---	---	---	---	---

<b>yes</b>	<b>100</b>	-				
<b>ill</b>	<b>100</b>					
seudobranch	37.5	62.5	-			
hymus	37.5	37.5	25			
at			100	-	-	
<b>pleen</b>	100	-		-	-	
ntestine	100	-		-	-	
idney	100	-		-	-	
<b>iver</b>	100	-		-	-	
esentery	100	-		-	-	
<b>perculum</b>	100	-		-	-	

	Length	Weight	Hematocrits	Serum	Protein
<b>verage</b>	109.25	12.5	40.75	4.15	
td. Dev.	4.993746	0	3.381937	0.531507	
of v	0.045706	0	0.082992	0.128074	
Factor	0.000009				
Factor	0.000346				

atchery: Spring Creek NFH Date: 5/14/90 Pond No: 14  
ode: S-22-15 May Release Sample Size: 8

		e	g	p	t	f	s	i	k	l	m	h	s	o	
ish	Ln.	y	i	s	h	a	p	n	i	e	e	p	p		
no.	Wt.	e	l	b	y	t	l	t	d	v	s	m	r	e	
	mm	gm	s	l	r	m	n	n	n	r	n	a	0	r	
1	110	84	N	0	1	1	2	0	0	0	0	43.0	5.2	0	<b>nec.</b> tis. gills
2	99		N	0	1	0	2	0	0	0	0	37.0	4.0	0	<b>nec.</b> tis. gills
3	101		N	0	1	0	3	0	0	0	0	38.0	4.2	0	<b>nec.</b> tis. gills
4	98		N	0	1	0	3	0	0	0	0	38.0	4.0	0	<b>nec.</b> tis. gills
5	97		N	0	0	0	2	0	0	0	0	40.0	3.7	0	Ich
6	115		N	0	0	1	2	0	0	0	0	45.0	5.0	0	Ich, <b>nec.</b> tis. gills, ad
7	93		N	0	0	0	2	0	0	0	0	46.0	3.8	0	Ich, <b>nec.</b> tis. gills
8	110		N	0	0	0	2	0	0	0	0	41.0	4.3	0	Ich, <b>nec.</b> tis. gills

eyes	=	eyes	ki dn	=	kidney
gill	=	gills	livr	=	liver
psbr	=	pseudobranch	mesn	=	mesentery
thym	=	thymus	<b>hema</b>	=	hematocrit
fat	=	fat ( <b>pyloric caeca</b> )	spro	=	serum protein
spln	=	spleen	oper	=	operculum
intn	=	intestine			

#### Percent in Each Category

	N/0	1	2	3	4	5	6
<b>yes</b>	100						
ill	100						
seudobranch	50	50					
<b>hymus</b>	75	25					
at			75	25	-		
pleen	100						
<b>ntestine</b>	100						
idney	100						
iver	100						
esentery	100						
perculum	100						

	Length	Weight	Hematocrits	Serum	Protein
verage	102.875	10.5	41	4.275	
td. Dev.	7.270445	0	3.162277	0.511737	
of v	0.070672	0	0.077128	0.119704	
Factor	0.000009				
Factor	0.000348				

SUMMARY OF CODE 5-22-17  
 SPRING CREEK NFH, MAY RELEASE

	N/O	3	4	5	6
EYES	100. 00				
GI LL	93. 75			6. 25	-
PSBR	50. 00	50. 00			
THYM	58. 33	39. 58	2. 08		
FAT			45. 83	54. 17	
SPLN	87. 50	-		2. 08	10. 42
INTN	100. 00	-			-
KIDN	97. 92	-		2. 08	
LIVR	97. 92		2. 08		
MESN	97. 92	2. 08			
OPER	100. 00				

	LENGTH	WEIGHT	HEMATOCRIT	SERUM PROTEIN
AVERAGE	108. 3333	12. 2167	43. 5417	4. 3833
STD DEV	5. 938732		2. 743469	0. 437904
C OF V	0. 051821		0. 062925	0. 100254
K FACTOR	0. 000009			
C FACTOR	0. 0003463			

SUMMARY OF CODE 5-22-15  
 SPRING CREEK NFH, MAY RELEASE

	N/O	1	2	3	4	5	6
EYES	100.00					-	
GI LL	97.92				2.08	-	
PSBR	41.67	56.25	2.08	-	-	-	-
THYM	43.75	47.92	8.33	-	-	*	-
FAT		7.25	75.00	18.75	*	-	-
SPLN	89.58				10.42	-	-
INTN	100.00					-	
KI DN	100.00	-	-	-	-	-	-
LI VR	100.00	-	-	-	-	-	-
MESN	<b>100.00</b>		-			-	-
OPER	97.92	2.08	-	-	-	-	-

AVERAGE	LENGTH	WEIGHT	HEMATOCRIT	SERUM PROTEIN
STD DEV	108.6667	12.2708	40.0467	4.2292
C OF V	5.073365		2.724034	0.446353
K FACTOR	0.046942		0.067747	0.105540
C FACTOR	0.000009			
	0.0003478			

atchery: Spring Creek NFH Date: 5/14/90 Pond No: 24  
ode: S-22-17 May Release Sample Size: 8

fish no.	Ln. mm	Wt. gm	e g p t f s i k l m h s o											Remarks
			y i s h a p n i e	e l b y t l t d v s	m n n r n	a	0	r	P	P	e	s	o	
1	100	97	N 0	1 1 2 0 0 0 0 0 46.0 4.3 0										
2	110		N 0	1 1 3 0 0 0 0 0 43.0 4.8 0	nec.	tis.	gills,	excess	body	fat				
3	113		N 0	0 0 3 0 0 0 0 0 44.0 4.5 0	nec.	tis.	gills,	excess	body	fat				
4	109		N 0	0 1 2 0 0 0 0 0 41.0 4.5 0	excess	body	fat,	fat/thym,	yolk	sac				
5	109		N 0	0 0 3 0 0 0 0 0 45.0 4.7 0	Ich,	nec.	tis.	gills						
6	111		N 0	0 1 2 0 0 0 0 0 49.0 5.3 0	Ich,	nec.	tis.	gills,	yolk	sac				
7	103		N 0	0 1 3 0 0 0 0 0 48.0 4.0 0	Ich,	nec.	tis.	gills						
8	108		N 0	1 2 3 0 0 0 0 0 42.0 4.3 0	Ich,	nec.	tis.	gills						

eyes	=	eyes	ki dn	=	kidney
gill	=	gills	livr	=	liver
psbr	=	pseudobranch	mesn	=	mesentery
thym	=	thymus	hema	=	hematocrit
fat	□	fat ( <b>pyloric caeca</b> )	spro	=	serum protein
sp1n	=	spleen	oper	=	operculum
intn	=	intestine			

Percent in Each Category

N/O	1	2	3	4	5	6
-----	---	---	---	---	---	---

yes	100		-			
gill	100		-			
pseudobranch	62.5	37.5	-			
thymus	25	62.5	12.5			
fat			37.5	62.5	-	
Spleen	100	-				
Intestine	100					
Kidney	100					
Liver	100					
Mesentery	100	-				
Operculum	100	-				

Length      Weight      Hematocrits      Serum Protein

Average	107.875	12.175	44.75	4.55
Std. Dev.	6.013648	0	2.633913	0.367423
S of v	0.037206	0	0.058858	0.080752
C Factor	0.000009			
C Factor	0.000348			

Hatchery: Spring Creek NFH Date: 5/14/90 Pond No: 25  
 Code: 5-22-17 May Release Sample Size: 8

fish no.	Ln. mm	Wt. gm	e g p t f s i k l m h s o												Remarks	
			y i s h a p n i i e e p P	e l b y t l t d v s m r e	s l r m n n n r n a 0 r											
1 103	99	N 0 0 1 3 4 0 0 0 0 41.0 4.1 0	<b>nec.</b>	tis.	gills											
2 95		N 0 0 0 3 0 0 0 0 0 43.0 4.7 0	<b>ad;</b>	<b>nec</b>	<b>tis,</b>	<b>fat/thym,</b>	<b>psbr;</b>	<b>blk</b>	spts	SP'						
3 111		N 0 1 1 2 0 0 0 0 0 43.0 4.5 0	<b>nec.</b>	tis.	gills											
4 125		N 0 0 1 3 0 0 0 0 0 39.0 4.5 0	ad													
5 96		N 0 0 0 2 0 0 0 0 0 41.0 4.4 0	Ich													
6 108		N 0 0 0 2 0 0 0 0 0 41.0 3.7 0	Ich,	<b>nec.</b>	tis.	gills										
7 110		N 0 0 0 3 0 0 0 0 0 44.0 5.3 0	Ich,	<b>nec.</b>	tis.	gills,	white	spots	Thy							
8 115		N 0 0 0 3 0 0 0 2 0 41.0 4.2 0	Ich													

eyes	=	eyes	ki dn	=	ki dney
gill	=	gills	livr	=	li ver
psbr	=	pseudobranch	mesn	=	mesentery
thym	=	thymus	<b>hema</b>	=	hematocrit
fat	=	fat ( <b>pyloric caeca</b> )	spro	=	serum protein
spln	=	spleen	oper	=	operculum
i nt n	=	intestine			

	Percent	in	Each	Category				
	N/O	1	2	3	4	5	6	
Eyes	100	-	-					
Gill	100							
Pseudobranch	87.5	12.5	-					
Thymus	62.5	37.5	-					
Fat	-		37.5	62.5	-			
Spleen	87.5	-			12.5	-		
I nt esti ne	100							
Ki dney	100							
Liver	87.5	-	12.5					
Mesentery	100	-						
Operculum	100							

	Length	Weight	Hematocrits	Serum	Protein
Average	107.875	12.375	41.625	4.425	
Std. Dev.	9.279513	0	1.494782	0.438035	
c of v	0.086020	0	0.035910	0.098991	
K Factor	0.000009				
C Factor	0.000356				

atchery: Spring Creek NFH Date: 5/14/90 Pond No: 26  
ode: 5-22-17 May Release Sample Size: 8

ish no.	Ln. mm	Wt. gm	e g p t f s i k l m h s o										Remarks
			s l r m	n n n r n	a	o	r						
1	103	91	N 0 0 0 3 4 0 0 0 0 45.0	3.8 0	fat	on	ki dney						
2	116		N 0 1 0 2 0 0 0 0 0 48.0	5.0 0	<b>nec.</b>	tis.	gills						
3	110		N 0 1 0 3 0 0 0 0 0 0 39.0	4.9 0									
4	112		N 0 1 1 3 0 0 0 0 0 40.0	4.1 0	ad								
5	100		N 0 0 0 3 0 0 0 0 0 43.0	4.0 0	ad,	<b>nec.</b>	tis.	gills					
6	108		N 0 1 1 2 0 0 0 0 0 44.0	4.7 0	Ich,	<b>nec.</b>	tis.	gills					
7	101		N 0 1 0 2 0 0 0 0 0 44.0	4.3 0	<b>nec.</b>	tis.	gills						
8	99		N 5 1 1 3 0 0 0 0 0 46.0	4.0 0	Ich,	ad,	<b>nec.</b>	tis.	gills				

eyes	=	eyes	ki dn	=	ki dney
gills	=	gills	livr	=	liver
psbr	=	pseudobranch	mesn	=	mesentery
thym	=	thymus	<b>hema</b>	=	hematocrit
fat	=	fat ( <i>pyloric caeca</i> )	spro	=	serum protein
spln	=	spleen	<b>oper</b>	=	operculum
intn	=	intestine			

	Percent	in	Each	Category			
	N / 0	1	2	3	4	5	6
yes	100	-	-				
ill	87. 5	-	-			12. 5	-
seudobranch	25	75	-				
hymus	62. 5	37. 5	-				
at			37. 5	62. 5	-		
pleen	87. 5	-			12. 5		
ntestine	100	-					
idney	100	-					
iver	100	-					
esentery	100	-					
perculum	100	-					
	Length	Wei ght		Hematocrits	Serum	Protein	
verage	106. 125	11. 375		43. 625		4. 35	
td. Dev.	' 5. 861687	0		2. 781074		0. 427200	
of V	0. 055233	0		0. 063749		0. 098206	
Factor	0. 000009						
Factor	0. 000343						

atchery: Spring Creek NFH Date: 5/14/90 Pond No: 27  
ode: 5-22-17 May Release Sample Size: 8

ish no.	Ln. mm	Wt. gm	e	g	p	t	f	s	i	k	l	m	h	s	o
			y	i	s	n	a	p	n	i	i	e	e	p	p
			el	b	y	t	l	t	d	v	s	m	r	e	
			sl	rm	nn	nn	rn	rn	rn	a	o	o	r	Remarks	
1	105	99	N	0	1	0	2	4	0	0	0	42.0	4.4	0	<b>nec.</b> tis. gills
2	102		N	0	1	0	2	0	0	0	0	40.0	3.6	0	<b>nec.</b> tis. gills
3	108		N	0	1	1	2	0	0	0	0	44.0	4.3	0	<b>nec.</b> tis. gills
4	112		N	0	1	0	2	0	0	0	0	40.0	4.2	0	
5	110		N	0	0	0	3	3	0	3	0	36.0	4.3	0	<b>nec.</b> tis. excess body fat, gross KD
6	111		N	0	1	0	3	0	0	0	0	49.0	4.2	0	Ich, <b>nec.</b> tis. gills
7	108		N	0	0	0	3	0	0	0	0	46.0	5.3	0	Ich, <b>nec.</b> tis. gills
8	115		N	0	1	0	3	0	0	0	0	43.0	4.2	0	Ich, <b>nec.</b> tis. gills, white fat Thym

eyes	=	<b>eyes</b>	ki dn	=	ki dney
gill	=	gills	livr	=	liver
psbr	=	pseudobranch	<b>mesn</b>	=	mesentery
thym	=	thymus	<b>hema</b>	=	hematocrit
fat	=	fat (pyloric caeca)	spro	=	serum protein
spl n	=	spleen	oper	=	operculum
int n	=	intestine			

	Percent	in	Each	Category			
	N/O		1	2	3	4	5
<b>yes</b>	100		-	-			
ill	100						
seudobranch	25	75	-				
hymus	87.5	12.5	-				
at	-		50	50	-		
pleen	75	-		12.5	12.5		
ntestine	100	-					
idney	87.5	-		12.5	-		
iver	100	-					
esentery	100	-					
<b>perculum</b>	100	-					

	Length	Weight	Hematocrits	Serum	Protein
verage	108.875	12.375	42.5	4.3125	
td. Dev.	3.822221	0	3.741657	0.437142	
of v	0.035106	.0	0.088038	0.101366	
Factor	0.000009				
Factor	0.000346				

Hatchery: Spring Creek NFH Date: 5/14/90 Pond No: 28  
 Code: 5-22-17 May Release Sample Size: 8

Fish no.	Ln. Wt. mm	Wt. gm	e	g	p	t	f	s	i	k	l	m	h	s	o	Remarks
			y	i	s	h	a	p	n	i	e	e	r	s	p	
1	120	99	N	0	1	0	3	0	0	0	0	46.0	5.1	0	<b>nec.</b>	tis. gills
2	112		N	5	1	1	3	0	0	0	0	44.0	3.9	0	<b>nec.</b>	tis. gills, hem. spleen
3	98		N	0	1	0	3	0	0	0	0	42.0	4.2	0	<b>nec.</b>	tis. gills, bl. spots spleen
4	115		N	0	1	1	3	0	0	0	0	43.0	3.3	0	excess body fat	
5	111		N	0	0	1	2	0	0	0	0	43.0	3.8	0	Ich, hem.	spleen
6	100		N	0	0	0	3	0	0	0	0	46.0	3.9	0	<b>nec.</b>	tis. gills
7	109		N	5	0	0	2	0	0	0	0	43.0	4.3	0	Ich	
8	107		N	0	0	0	2	0	0	0	0	51.0	3.9	0	Ich, white spots	kd

eyes	≡	eyes	ki dn	≡	kidney
gill	≡	gills	livr	≡	liver
<b>psbr</b>	≡	pseudobranch	<b>mesn</b>	≡	<b>mesentery</b>
thym	≡	<b>thymus</b>	<b>hema</b>	≡	hematocrit
fat	≡	fat ( <b>pyloric caeca</b> )	spro	≡	serum protein
<b>spn</b>	≡	spleen	oper	≡	operculum
intn	≡	intestine.			

	N/O	Percent in Each Category					
		1	2	3	4	5	6
Eyes	100	-	-				-
Gill	75				25		-
Pseudobranch	50	50	-				-
<b>Thymus</b>	62.5	37.5	-				-
Fat			37.5	62.5	-	-	-
Spleen	100						
Intestine	100	-					
Kidney	100	-					
Liver	100	-					
Mesentery	100	-					
Operculum	100	-					

	Length	Weight	Hematocrits	Serum	Protein
Average	109	12.375	44.75		4.05
Std. Dev.	6.855654	0	2.727178		0.484767
c of v	0.062895	0	0.060942		0.119695
K Factor	0.000009				
C Factor	0.000345				

Hatchery: Spring Creek NFH Date: 5/14/90 Pond No: 29  
 Code: 5-22-18 May Release Sample Size: 8

Fish no.	Ln.	Wt. mm	e g p t f s i k l m h s o										Remarks		
			s l	r m	n n	n r n	a	0	r	e	m	r			
1	111	102	N	0	1	0	2	0	0	0	0	41.0	4.2	0	<b>nec.</b> tis. yil ls, yolk sac
2	114		N	0	1	1	3	0	0	0	0	38.0	4.0	0	<b>nec.</b> tis. gill s
4	111		N	0	1	0	3	0	0	0	0	41.0	4.0	0	<b>nec.</b> tis. yil ls
5	115 112		N	0	1	0	3	0	0	0	0	45.0	4.1	0	ad, <b>nec.</b> tis. gills
			N	0	0	1	3	0	0	0	0	46.0	5.2	0	ad, <b>nec.</b> tis. gills
6	105		N	0	0	0	2	0	0	0	0	42.0	3.7	0	Ich, <b>nec.</b> tis. gills
7	106		N	0	1	0	2	0	0	0	0	45.0	4.6	0	Ich
8	110		N	0	1	0	3	0	0	0	0	49.0	4.5	0	Ich, <b>nec.</b> tis. gills

eyes	5	eyes	kidn	#	kidney
gill	#	gill s	livr	#	liver
psbr	#	pseudobranch	mesn	#	mesentery
thym	#	thymus	hem a	#	hematocrit
fat	#	fat (pyloric <b>caeca</b> )	spro	#	serum protein
spln	#	spleen	oper	#	operculum
intn	#	intestine			

Percent in Each Category

	N/O	1	2	3	4	5	6
Eyes	100						
Gill	100						-
Pseudobranch	25	75					-
Thymus	75	25					-
fat			37.5	62.5	-		-
Spleen	100						
Intestine	100						
Kidney	100						
Liver	100						
Mesentery	100						
Operculum	100						

	Length	Weight	Hematocrits	Serum	Protein
Average	110.5	12.75	43.375	4.2875	
Std. Dev.	3.278719	0	3.276335	0.437142	
c of v	0.029671	0	0.075535	0.101957	
K Factor	0.000009				
C Factor	0.000341				

atchery: Spring Creek NFH Date: 5/14/90 Pond No: 23  
ode: 5-22-17 May Release Sample Size: 8

		e	g	p	t	f	s	i	k	l	m	h	s	o	
ish	Ln.	y	i	s	h	a	p	n	i	i	e	e	p	p	
no.	Wt.	e	l	b	y	t	l	t	d	v	s	m	r	e	
1															Remarks
2	111	N	0	1	0	3	0	0	0	0	0	47.0	4.3	0	nec. tis. gills
3	112	N	0	1	1	2	0	0	0	0	0	38.0	4.2	0	nec. tis. gills, excess body fat
4	112	N	0	1	1	2	0	0	0	0	0	38.0	4.2	0	nec. tis. gills, excess body fat
5	117	N	0	0	1	2	0	0	0	0	0	43.0	5.0	0	Ich nec. tis gills
6	107	N	0	0	0	2	4	0	0	0	0	48.0	4.5	0	Ich, nec. tis. gills, excess body fat
7	110	N	0	0	1	3	0	0	0	0	1	45.0	4.0	0	Ich, nec. tis. gills, excess body fat
8	112	N	0	0	1	2	4	0	0	0	0	44.0	4.4	0	Ich, nec. tis. gills, excess body fat

eyes	=	eyes	ki dn	=	ki dney
gill	=	gills	li vr	=	liver
psbr	=	pseudobranch	mesn	=	mesentery
thym	=	thymus	<b>hema</b>	=	hematocrit
fat	=	fat ( <b>pyloric caeca</b> )	spro	=	serum protein
spl n	=	spleen	oper	=	operculum
intn	=	intestine			

Percent in Each Category

	N/O	1	2	3	4	5	6
<b>y</b> es	100						
ill	100	-	-				
seudobranch	50	50	-				
hyamus	50	50	-				
at		75	25	-			
<b>pleen</b>	75	-	-		25		
ntestine	100	-	-				
i dney	100	-					
i ver	100	-	-				
esentery	87. 5	12. 5	-				
perculum	100	-	-				

	Length	Weight	Hematocrits	Serum	Protein
<b>verage</b>	110. 25	12. 625	44	4. 6125	
t d. Dev.	3. 799671	0	3. 082207	0. 472857	
of v	0. 034464	0	.0.070050	0. 102516	
Factor	0. 000009				
Factor	0. 000340				

Hatchery: Spring Creek NFH Date: 5/14/90 Pond No: 30  
 Code: 5-22-18 May Release Sample Size: 8

fish no.	Ln. mm	Wt. gm	e g p t f s i k l m h										s 0 p p r e 0 r	Remarks	
			e	1	b	y	t	1	t	d	v	s			
1	109	90	N	0	1	0	3	3	0	0	0	0	46.0	4.6 0	nec. tis. gills, lumpy/enlarged/red spl.
2	112		N	5	0	0	2	0	0	0	0	0	45.0	4.8 0	nec. tis. gills
3	108		N	0	0	2	3	0	0	0	0	0	42.0	4.6 0	nec. tis. gills, petechial hem. Psbr
4	106		N	4	1	0	3	0	0	0	0	0	42.0	3.9 0	nec. tis. gills, yellow fat/Pyloric
5	100		N	0	0	1	2	0	0	0	0	0	40.0	4.6 0	nec. tis. gills
6	114		N	0	1	2	2	4	0	0	0	0	44.0	5.4 0	
7	94		N	0	0	0	3	0	0	0	0	0	48.0	5.3 0	Ich, nec. tis. gills, lt. pink spleen
8	104		N	4	0	1	2	4	0	3	1	0	15.0	1.6 0	Ich, nec. tis., swollen caeca, (cont.) hem spl/ovary, BKD
eyes	=	eyes											kidn	=	kidney
gill	=	gills											livr	=	liver
psbr	=	pseudobranch											mesn	=	mesentery
thym	=	thymus											hema	=	hematocrit
fat	=	fat (pyloric caeca)											spro	=	serum protein
spl n	=	spleen											oper	=	operculum
int n	=	intestine													

	Percent in Each Category						
	N/0	1	2	3	4	5	6
Eyes	100	-	-				
Gill	62.5	-	-				
Pseudobranch	62.5	37.5	-		25	12.5	-
Thymus	50	25	25				
Fat			50	50	-		
Spleen	62.5	-		12.5	25		
Intestine	100	-	-				
Kidney	87.5	-	-	12.5	-		
Liver	87.5	12.5	-				
Mesentery	100	-	-				
Operculum	100	-	-				
	Length	Weight		Hematocrits		Serum	Protein
Average	105.875	11.25		40.25		4.35	
Std. Dev.	6.091746	0		9.832980		1.126942	
C of v	0.057537	0		0.244297		0.259067	
C Factor	0.000009						
C Factor	0.000342						

Latchery: Spring Creek NFH Date: 5/14/90 Pond No: 31  
 Code: 5-22-18 May Release Sample Size: 8

fish no.	Ln. mm	Wt. gm	e g p t f s i k l m h s o										Remarks		
			s	1	r	m	n	n	n	r	n	a		0	r
1	115	111	N	0	1	0	2	0	0	0	0	43.0	5.0	0	white spots gills
2	110		N	0	1	1	3	0	0	0	0	40.0	4.3	0	white spots gills, yolk sac
3	112		N	0	1	1	2	0	0	0	0	45.0	3.7	0	
4	107		N	0	1	0	2	0	0	0	0	45.0	4.8	0	nec. tis./white spots gills
5	111		N	0	1	1	2	0	0	0	0	45.0	4.3	0	Ich, white spots gills
6	112		N	0	0	1	3	0	0	0	0	42.0	5.0	0	Ich, white spots gills
7	109		N	0	0	0	3	0	0	0	0	42.0	3.4	0	Ich, white spots gills, blk spots
8	121		N	0	1	1	3	0	0	0	0	43.0	4.8	0	Ich, ad, white spots gills

eyes	=	eyes	kidn	=	kidney
gill	=	gills	livr	=	liver
psbr	=	pseudobranch	mesn	=	mesentery
thym	=	thymus	hema	=	hematocrit
fat	=	fat ( <b>pyloric caeca</b> )	spro	=	serum protein
spl n	=	spleen	oper	=	operculum
intn	=	intestine			

	Percent	in	Each	Category				
	N/O	1	2	3	4	5	6	
Eyes	100	-						
Gill	100	-						
Pseudobranch	25	75						
Thymus	37.5	62.5	-					
Fat			50	50	-			
Spleen	100	-						
Intestine	100	-						
Kidney	100	-						
Liver	100	-						
Mesentery	100	-						
Operculum	100	-						

	Length	Weight	Hematocrits	Serum	Protein
Average	112.125	13.875	43.125	4.4125	
Std. Dev.	4.013648	0	1.690968	0.564441	
c of v	0.035796	0	0.039210	0.127918	
K Factor	0.000009				
C Factor	0.000355				

Hatchery: Spring Creek NFH Date: 5/14/90 Pond No: 32  
 Code: 5-22-18 May Release Sample Size: 8

Fish no.	Ln. mm	Wt. gm	e g p t f s i k l m h s o										Remarks	
			s 1	r m	n n n r n	a	0	r	P					
1	107	90	N	0	0	1	2	0	0	0	0	39.0	4.1	ad
2	100		N	0	1	0	3	0	0	0	0	44.0	4.8	0 nec. tis. gills, blk spots sp1n
3	98		N	0	1	1	2	0	0	0	0	44.0	4.3	0
4	109		N	0	0	0	3	0	0	0	0	42.0	4.2	0 nec. tis. gills, white spots Psbr.
5	121		N	0	1	1	2	0	0	0	0	44.0	4.7	0 Ich, ad, nec. tis. gills
6	111		N	0	1	0	2	0	0	0	0	40.0	4.0	0 Ich, nec. tis. gills
7	109		N	0	1	1	2	0	0	0	0	45.0	4.0	1 Ich, white spots gills
8	86		N	0	0	0	3	0	0	0	0	42.0	4.0	0 Ich, white spots gills

eyes	=	eyes	kidn	=	kidney
gill	=	gills	livr	=	liver
psbr	=	pseudobranch	mesn	=	mesentery
thym	=	thymus	hema	=	hematocrit
fat	=	fat (pyloric caeca)	spro	=	serum protein
spln	=	spleen	oper	=	operculum
intn	=	intestine			

	Percent	in	Each	Category			
	N/O	1	2	3	4	5	6
Eyes	100	-	-	-	-	-	-
Gill	100						
Pseudobranch	37.5	62.5	-	-	-	-	-
Thymus	50	50	-	-	-	-	-
Fat			62.5	37.5	*	-	-
Spleen	100	-	-	-	-	-	-
Intestine	100	-	-	-	-	-	-
Kidney	100	-	-	-	-	-	-
Liver	100	-	-	-	-	-	-
Mesentery	-	-	-	-	-	-	-
Operculum	180.5	12.5	*	*	-	-	-
Average	Length	Weight		Hematocrits	Serum	Protein	
Average	105.125	11.25		42.5		4.2625	
Std. Dev.	9.765212	0		2		0.299739	
C of v	0.092891	0		0.047058		0.070320	
$\times$ Factor	0.000009						
$\times$ Factor	0.000349						

SUMMARY OF CODE 5-22-18  
SPRING CREEK NFH, MAY RELEASE

	N/O	1	2	3	4	5	6
EYES	100. 00	-		-		-	-
GI LL	90. 62				6. 25	<b>3.13</b>	-
PSBR	37. 50	62. 50		-		-	-
THYM	53. 13	40. 63	6. 25	-		-	-
FAT			50. 00	<b>50.00</b>		-	-
<b>SPLN</b>	90. 63	-		<b>3.13</b>	6. 25	-	-
I NTN	<b>100. 00</b>	-		-		-	-
KI DN	96. 87	-		<b>3.13</b>		-	-
LI VR	96. 87	<b>3.13</b>		-		-	-
MESN	<b>100. 00</b>	-		-		-	-
OPER	96. 87	<b>3.13</b>		-		-	-

	LENGTH	WEIGHT	HEMATOCRIT	SERUM PROTEIN
AVERAGE	108. 4063	12. 2813	42. 3125	4. 3281
STD DEV	5. 787331		4. 200071	0. 607066
C OF V	0. 053974		0. 101525	0. 139816
K FACTOR	0. 000009			
C FACTOR	0. 0003468			

Hatchery: Spring Creek NFH Date: 5/15/90 Pond No: 15  
 May Release Diet Study Diet: ABERDRY Sample Size: 29  
 Code: 5-22-16

Fish no.	Ln.	Wt. mm	L	R	M	N	N	N	R	A	S	O
1		104			N	0	0	0	0	0	0	0
2		107			N	0	0	0	3	0	0	0
3		106			N	0	0	1	2	0	0	0
4		123			N	5	1	1	3	0	0	0
5		112			N	0	0	1	3	0	0	0
6		109			N	0	1	0	2	0	0	0
7		104			N	0	0	1	3	0	0	0
8		104			N	5	0	0	3	0	0	0
9		122			N	0	1	1	3	0	0	2
10		114			N	5	0	0	2	0	0	0
11		111			N	0	1	0	3	0	0	0
12		96										
13		105										
14		108			N	0	1	1	3	0	0	0
15		110	192		N	0	1	0	3	0	0	0
16		110			N	0	1	2	3	0	0	0
17		90			N	0	1	0	2	0	0	0
18		112			N	0	1	0	2	0	0	0
19		121			N	0	0	1	3	0	0	0
20		105			N	5	1	1	3	0	0	0
21		113			N	0	1	1	2	4	0	0
22		111			N	0	0	1	2	0	0	0
23		110			N	0	1	2	2	0	0	0
24		107			N	0	0	0	3	0	0	0
25		114			N	0	1	1	3	0	0	0
26		107			N	0	0	1	3	0	0	0
27		115			N	0	0	1	3	0	0	0
28		110			N	0	1	0	3	0	0	0
29		113			N	0	0	0	2	0	0	0

ex fat mesn = ex fat mesentery  
**nec** tiss = necrotic tissue  
**ex (yellw)** fat = excess (yellow) fat  
 wht spts = white spots  
 pet hem = petechial hemorrhage  
 swoln = swollen

eyes = eyes  
 gill = gills  
**psbr** = pseudobranch  
 thym = thymus  
 fat = fat (**pyloric caeca**)  
 spln = spleen  
 intn = intestine

kidn = kidney  
 livr = liver  
 mesn = mesentery  
**hema** = hematocrit  
 spro = serum protein  
 oper = operculum

ad = adipose fin clipped  
**nec** tiss = necrotic tissue  
**ex (yellw)** fat = excess (yellow) fat  
 wht spts = white spots  
 pet hem = petechial hemorrhage  
 swoln = swollen

Percent in Each Category

	N/0	1	2	3	4	5	6
<b>y</b> <b>e</b> <b>s</b>	100	-	-	-	-	-	-
<b>i</b> <b>l</b> <b>l</b>	86	-	-	-	14	-	-
<b>p</b> <b>seudobranch</b>	55	45	-	-	-	-	-
<b>h</b> <b>y</b> <b>m</b> <b>u</b> <b>s</b>				-	-	-	-
<b>a</b> <b>t</b>	45	48	3:	69	-	-	-
<b>p</b> <b>le</b> <b>e</b> <b>n</b>	<b>97</b>	-	-	-	3	-	-
<b>n</b> <b>te</b> <b>s</b> <b>t</b> <b>i</b> <b>n</b> <b>e</b>	100	-	-	-	-	-	-
<b>i</b> <b>d</b> <b>n</b> <b>e</b> <b>y</b>	97	-	3	-	-	-	-
<b>i</b> <b>v</b> <b>e</b>	100	-	-	-	-	-	-
<b>e</b> <b>s</b> <b>e</b> <b>n</b> <b>t</b> <b>e</b> <b>r</b> <b>y</b>	100	-	-	-	-	-	-
<b>i</b> <b>p</b> <b>er</b> <b>c</b> <b>u</b> <b>l</b> <b>u</b> <b>m</b>	86	<b>14</b>	-	-	-	-	-

	Length	Weight	Hematocrit	Serum Protein
AVERAGE	109.4137	12.58620	40.22413	4.189655
STD DEV	6.723695	0	3.666216	0.453602
C OF V	0.061451	0	0.091144	0.108267
K FACTOR	0.000009			
C FACTOR	0.000347			

atchery: Spring Creek NFH  
 May Release Diet Study

Date: 5/15/90  
 Diet: ABERDRY  
 Code: 5-22-16

Pond No: 16  
 Sample Size: 29

ish no.	Ln.	Wt. mm	e g y i s b l	p t h y i s h a p n i	t f i e l m i e	s i k v s m	l m r	h e	s r	o r
			<b>s 1</b>	<b>r m</b>	<b>n n n r n</b>	<b>a</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>

1	102	161	N	0	1	0	2	3	0	0	0	60.0	5.2	0	black	<b>spln</b> ,	wht	spts	gills
2	108		N	0	1	0	2	0	0	0	0	40.0	3.8	0	<b>nec</b>	tiss	gills		
3	112		N	0	0	1	2	0	0	0	0	38.0	4.1	0	wht	spts	gills		
4	106		N	0	0	1	2	0	0	0	0	40.0	4.1	0	<b>nec</b>	tiss	gills		
5	113		N	0	1	0	3	0	0	0	0	38.5	4.4	0	<b>nec</b>	tiss	gills		
6	107		N	0	0	1	2	0	0	0	0	43.0	4.0	0	wht	spts	gills		
7	116		N	0	0	1	2	0	0	0	0	43.0	4.1	0	<b>nec</b>	tiss	gills		
8	99		N	0	0	0	2	0	0	0	0	38.0	3.5	0	<b>nec</b>	tiss	gills		
9	109		N	4	0	0	2	4	0	0	0	39.0	3.6	0					
10	108		N	5	0	1	3	4	0	0	0	39.5	4.0	0	wht	spts	gills		
11	100		N	0	0	1	2	0	0	0	0	40.0	4.0	0	Ich,	wht	<b>spts</b>	gills	
12	114		N	0	1	1	2	0	0	0	0	39.0	4.1	0	Ich,	ad			
13	95		N	0	1	1	3	0	0	0	0	43.0	4.6	0	Ich,	wht	spts	gills,	yllw fat pyloric
14	114		N	0	0	0	3	0	0	0	0	40.0	4.1	0	Ich,	wht	spts	thymus,	<b>nec</b> tiss gills
15	107	197	N	0	0	0	2	0	0	0	0	39.0	4.5	0	ad,	<b>nec</b>	tiss	gills	
16	110		N	0	<b>1</b>	1	3	0	0	0	0	42.0	4.5	0					
17	106		N	0	0	1	2	0	0	0	0	42.0	4.2	0	wht	<b>spts</b>	gills		
18	105		N	0	1	1	2	0	0	0	0	37.0	3.9	0	Ich,	<b>nec</b>	tiss	gills	
19	115		N	0	1	0	3	0	0	0	0	42.0	3.8	0	Ich,	<b>nec</b>	tiss	gills	
20	108		N	0	1	0	2	0	0	0	0	41.0	4.2	0	Ich,	<b>nec</b>	tiss	gills	
21	110		N	0	0	0	2	0	0	0	0	42.0	5.0	0	Ich,	<b>nec</b>	tiss	gills,	wht fat thymus
22	118		N	0	1	0	3	0	0	0	0	43.0	4.1	0					
23	121		N	0	0	0	3	0	0	0	0	40.0	5.0	0	wht	spts	gills,	lt pink	spleen
24	118		N	0	0	0	3	0	0	0	0	42.0	4.8	0	<b>nec</b>	tiss	gills		
25	105		N	0	0	1	3	0	0	0	0	38.0	5.1	0	<b>nec</b>	tiss	gills,	lt pink	spln/blk spot
26	110		N	0	1	1	3	1	0	0	0	41.0	4.4	0	Ich,	<b>nec</b>	tiss	gills	
27	113		N	0	1	<b>1</b>	2	4	0	0	0	42.0	4.6	0	Ich,	<b>nec</b>	tiss	gills	
28	113		N	0	0	0	3	0	0	0	0	41.0	4.2	0	Ich,	wht	spts	gills	
29	114		N	0	0	0	3	0	0	0	0	41.0	4.5	0	Ich,	<b>nec</b>	tiss	gills	

eyes	= eyes	ki dn	=	kidney
gill	= gills	livr	=	liver
psbr	= pseudobranch	mesn	=	mesentery
thym	= thymus	<b>hema</b>	=	hematocrit
fat	= fat (pyloric <b>caeca</b> )	<b>spro</b>	=	<b>SERUM</b> protein
spln	= spleen	oper	=	operculum
intn	= intestine			

ad = adipose fin clipped  
**nec** tiss = necrotic tissue  
 ex (yllw) fat = excess (yellow) fat  
 wht spt = white spots  
 pet hem = petechial hemorrhage  
 swoln = swollen

Percent in Each Category

	N/0	1	2	3	4	5	6
<b>y</b> <b>e</b> <b>s</b>	100	-	-	-	-	-	-
ill	93	-	-	-	3	3	-
seudobranch	59	<b>41</b>	-	-	-	-	-
hymus	52	48	-	-	-	-	-
at			55	45	-	-	-
pleen	83	3	-	3	10	-	-
ntestine	100	-	-	-	-	-	-
dney	100	-	-	-	-	-	-
<b>i</b> <b>v</b> <b>e</b> <b>r</b>	100	-	-	-	-	-	-
esentery	100	-	-	-	-	-	-
perculum	100	-	-	-	-	-	-

	Length	Weight	Hematocrit	Serum Protein
AVERAGE	109.5172	12.34482	41.17241	4.289655
STD DEV	5.887571	0	3.941984	0.428586
C OF V	0.053759	0	0.095743	0.099911
K FACTOR	0.000009			
C FACTOR	0.000339			

tchery: Spring Creek NFH Date: 5/15/90 Pond No: 17  
 Way Release Diet Study Diet: ABERDRY Sample Size: 29  
 Code: 5-22-16

	e	g	p	t	f	s	i	k	l	m	h	s	o		
sh	Ln.	Wt.	el	b	y	t	l	t	d	v	s	m	r	e	
10.	mm	gm	s	l	r	m	n	n	n	r	n	a	0	r	
1	<b>93</b>	<b>164</b>	<b>N</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	36.0	4.2	0	
2	1	0	4	N	0	0	0	2	0	0	0	37.0	4.0	0	
3	1	1	6	N	0	0	1	2	4	0	0	41.0	4.8	0	wht spts gills
4		9	9	N	0	1	1	2	0	0	0	41.0	4.1	0	wht spts gills
5	1	0	7	N	0	0	1	3	0	0	0	42.0	3.9	0	wht spts gills
6	1	0	3	N	0	0	1	3	0	0	0	37.0	4.5	0	ad, wht <b>spts</b> gills
7	<b>114</b>			N	0	1	1	3	4	0	0	43.0	4.6	0	<b>nec</b> tiss gills, pet hem psbr
8	<b>116</b>			N	0	0	1	3	0	0	0	42.0	4.1	0	<b>nec</b> tiss, pet hem psbr, yellw fat
9	1	0	3	N	0	0	1	2	0	0	0	37.0	4.1	0	
10	<b>105</b>	N	0113	0	0	0	0	0	0	0	0	36.0	4.0	0	
11	<b>107</b>	N	0	0	1	3	0	0	0	0	0	37.0	4.0	0	Ich
12				N	5	0	1	2	0	0	0	38.0	3.5	0	Ich, wht <b>spts</b> gills, hem psbr
13	1	1	0	N	0	0	1	3	0	0	0	41.0	4.1	0	Ich, <b>nec</b> tiss gills
14	1	0	5	N	0	0	0	3	4	0	0	43.0	4.0	0	Ich, <b>nec</b> tiss gills, black <b>spleen</b>
15	<b>99</b>	<b>177</b>	<b>N</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	46.0	4.2	0	<b>nec</b> tiss gills
16	108			N	0	1	1	2	0	0	0	38.0	4.9	0	wht spts gills
17	1	0	4	N	0	1	2	2	0	0	0	42.0	4.1	0	wht spts gills
18	98			N	0	0	2	3	0	0	0	38.5	3.8	0	<b>nec</b> tiss gills, hem psbr
19	114			N	0	1	1	2	0	0	0	47.0	4.5	0	<b>nec</b> tiss gills
20	111			N	0	0	1	2	0	0	0	38.5	4.0	0	<b>nec</b> tiss gills
21	114			N	0	0	1	2	0	0	0	37.0	4.5	0	<b>nec</b> tiss gills
22	109			N	0	0	0	3	0	0	0	39.5	4.5	0	<b>nec</b> tiss gills
23	105			N	4	0	1	3	0	0	2	39.0	3.9	0	wht spts gills
24	97			N	4	0	0	3	0	0	0	40.0	4.0	0	wht spts gills & psbr
25	108			N	5	0	0	3	0	0	0	46.0	4.1	0	<b>nec</b> tiss gills & psbr
26	<b>111</b>	N	0	0	0	2	3	0	0	0	0	41.0	4.5	0	Ich, <b>nec</b> tiss(bad)/ruptured cells gill
27	<b>111</b>	N	0	1	1	3	0	0	0	0	0	40.0	4.2	0	Ich, <b>nec</b> spts tiss gills
28				N	0	1	0	2	0	0	0	49.0	4.2	0	Ich, <b>nec</b> tiss gill
29				N	0	1	0	2	0	0	0				

eyes	= eyes	ki dn	= ki dney
gill	= gills	livr	= liver
psbr	= pseudobranch	mesn	= mesentery
thym	= thymus	hem	= hematocrit
fat	= fat ( <b>pyloric caeca</b> )	spro	= serum protein
spn	= spleen	oper	= operculum
intn	= intestine		

ad = adipose fin clipped  
**nec** tiss = necrotic tissue  
 ex (yellw) fat = excess (yellow) fat  
 wht spt = white spots  
 pet hem = petechial hemorrhage  
 swollen = swollen

SUMMARY OF CODE 5-22-16  
 SPRING CREEK NFH, MAY RELEASE

	N/O	1	2	3	4	5	6
EYES	100.00		-		-		-
GI LL	91.38		-		<b>2.59</b>	6.03	-
<b>PSBR</b>	<b>50.00</b>	<b>50.00</b>	-				-
THYM	41.38	53.45	<b>5.17</b>				-
FAT			<b>50.00</b>	<b>50.00</b>			-
SPLN	86.21	0.86		4.31	8.62		-
I NTN	100.00						-
KI DN	99.14	-	0.86				-
LI VR	99.14		0.86				-
MESN	99.14	0.86					-
OPER	96.55	3.45					-

	LENGTH	WEIGHT	HEMATOCRIT	SERUM PROTEIN
AVERAGE	108.7586	12.2414	40.4612	4.2095
STD DEV	6.230224		3.476810	0.486890
C OF V	0.057295		0.085859	0.115995
K FACTOR	0.000009			
C FACTOR	0.0003433			

**atchery:** Spring Creek NFH Date: **5/15/90** Pond No: 18  
 May Release Diet Study Diet: BI ODRY Sample Size: 29  
 Code: 5-23-35

			e	g	p	t	f	s	i	k	l	m	h	<b>s</b>	0
ish	Ln.	Wt.	y	i	s	h	a	p	n	i	e	P	P		
no.	mm	gm	el	l	b	y	t	l	d	v	s	m	r	e	
1	115	166	N	0	0	1	3	0	0	0	0	38.0	3.6	0	<b>nec</b> tiss/wht spts gills
2	110		N	0	0	0	3	0	0	0	0	35.0	4.1	0	ad, <b>nec</b> tiss gills
<b>4</b>	<b>109</b>		N	0	0	0	3	0	0	0	0	37.0	4.9	0	wht spts <b>thymus/gills</b>
<b>5</b>	<b>111</b>		N	0	1	0	3	0	0	0	0	37.0	4.2	0	<b>nec</b> tiss gills, yellw fat pyloric
			N	0	1	0	3	0	0	0	0	36.0	4.1	0	wht spts gills
6	110		N	0	0	1	3	0	0	0	0	41.0	4.1	0	<b>nec</b> tiss gills, ex yellw fat pyloric
7	111		N	0	1	1	3	0	0	0	0	36.0	4.1	0	<b>nec</b> tiss gills, ex yellw fat pyloric
8	97		N	0	1	1	3	0	0	0	0	35.0	4.1	0	<b>nec</b> tiss gills
9	89		N	0	0	0	3	0	0	0	0	39.0	3.9	0	Ich
10	98		N	4	1	1	3	0	0	0	0	36.0	4.0	0	Ich, lt. pink spleen/black spots
11	115		N	0	0	0	3	0	0	0	0	38.0	3.9	0	Ich, ad, <b>nec</b> tiss gills
12	107		N	0	1	0	3	0	0	0	0	39.0	3.4	0	Ich, ad
13	114		N	0	1	1	3	0	0	0	0	37.0	4.6	0	<b>nec</b> tiss/wht spts gills, ex fat mesn
14	122		N	0	1	0	3	0	0	0	0	38.0	4.2	0	ex fat pyloric & mesn
15	113	185	N	0	1	0	3	3	0	0	0	35.0	4.3	0	
<b>16</b>	100		N	0	1	1	2	0	0	0	0	35.0	3.8	0	ad, <b>nec</b> tiss gills, ex yellw fat <b>pyloric</b>
17	109		N	0	0	1	2	0	0	0	0	37.0	3.4	0	<b>nec</b> tiss gills
18	121		N	0	1	2	3	0	0	0	1	41.0	4.4	0	<b>nec</b> tiss/wht sots gill, yellw fat <b>pyloric</b>
19	108		N	0	0	0	3	0	0	0	0	43.0	5.0	0	<b>nec</b> tiss gills; ex yellw fat pyloric
20	105		N	0	0	2	3	0	0	0	0	38.0	4.5	0	wht spts gills
21	106		N	0	1	0	3	0	0	0	0	37.0	4.2	0	wht <b>spts</b> gills
<b>22</b>	110		N	0	0	1	3	0	0	0	0	41.0	4.5	0	Ich, <b>nec</b> tiss gills, yok sac
<b>23</b>	<b>98</b>		N	0	0	0	3	0	0	0	0	37.0	4.1	0	Ich
24	<b>118</b>		N	0	1	1	2	0	0	0	0	37.0	4.5	0	Ich, <b>nec</b> tiss gills
25	93		N	0	0	0	3	0	0	0	0	38.0	3.8	0	Ich, ad., wht <b>spts</b> gills
26	108		N	0	0	2	3	0	0	0	0	37.0	4.2	0	wht <b>sptst</b> <b>hymus</b>
27	109		N	0	1	1	3	0	0	0	0	40.0	5.0	0	<b>nec</b> tiss gills
28	112		N	0	1	0	3	0	0	0	0	40.0	4.0	0	<b>nec</b> tiss gills
29	107		N	0	1	1.3	3	0	0	0	0	44.0	4.4	0	wht <b>spts</b> gills, yok sac

eyes	= eyes	ki dn	= kidney
gill	= gills	<b>livr</b>	= liver
psbr	= pseudobranch	mesn	= mesenter y
thym	= thymus	<b>hem</b>	= hematocrit
fat	= fat (pyloric <b>caeca</b> )	spro	= serum protein
spl n	= spleen	oper	= operculum
intn	= intestine		

ad = adipose fin clipped  
**nec** tiss = necrotic tissue  
 ex (yellw) fat = excess (yellow) fat  
 wht spt = white spots  
 pet hem = petechial hemorrhage  
 swoln = swollen

Percent in Each Category

	N/0	1	2	3	4	5	6
<b>y</b> <b>e</b> <b>s</b>	100	-	-	-			
ill	97	-	-	-	3	I	-
seudobranch	45	55	-	-			
hymus	48	41	10	-			
at	-		10	90			
pleen	97	-	-	3			
<b>n</b> <b>t</b> <b>e</b> <b>s</b> <b>t</b> <b>i</b> <b>n</b> <b>e</b>	100	-	-	-			
dney	100	-	-	-			
<b>i</b> <b>v</b> <b>e</b> <b>r</b>	100	-	-	-			
esentery	97	3	-	-			
perculum	100	-	-	-			

	Length	Weight	Hematocrit	Serum Protein
AVERAGE	107.9655	12.10344	38	4.182758
STD DEV	7.572558	0	2.304418	0.396596
C OF V	0.070138	0	0.060642	0.094817
K FACTOR	0.000009			
C FACTOR	0.000347			

rtchery: Spring Creek NFH  
May Release Diet Study

Date: 5/15-16/90 Pond No: 19  
Diet: BIODRY Sample Size: 29  
Code: 5-23-36

sh	Ln.	Wt.	e	g	p	t	f	s	i	k	l	m	h	s	o
10.		mm	s	1	r	m	n	n	n	r	n	a	0	r	
1	108	169	N	0	0	0	2	0	0	0	0	0	34.0	4.1	0
2	111		N	0	1	0	2	0	0	0	0	0	34.0	4.1	0
3	112		N	0	0	0	3	0	0	0	0	0	35.0	4.1	0
4	105		N	0	1	1	2	0	0	0	0	0	40.0	4.2	0
5	95		N	0	1	1	2	0	0	0	0	0	41.0	4.1	0
6	114		N	0	1	1	3	0	0	0	0	0	37.0	4.2	0
7	109		N	0	0	1	2	3	0	0	0	0	42.0	4.8	0
8	103		N	0	0	.2	3	0	0	0	0	0	40.0	4.2	0
9	114		N	0	1	0	3	0	0	0	0	0	36.0	4.0	0
0	105		N	0	1	0	2	0	0	0	0	0	37.0	4.1	0
1	115		N	5	0	1	2	0	0	0	0	0	39.5	4.1	0
2	122		N	0	1	0	3	0	0	0	0	0	37.0	4.1	0
3	108		N	0	0	0	3	0	0	0	0	0	37.0	4.9	0
4	91		N	0	1	0	3	0	0	0	0	0	45.0	3.2	0
5	112	174	N	0	0	0	2	0	0	0	0	0	43.0	4.0	0
6	110		N	0	1	1	2	0	0	0	0	0	40.0	4.8	0
7	112		N	0	1	1	2	0	0	0	0	0	39.0	4.2	0
8	114		N	0	1	1	2	0	0	0	0	0	42.0	4.4	0
9	105		N	0	1	1	.2	0	0	0	0	0	40.5	4.2	0
20	115		N	0	1	1	3	0	0	0	0	0	42.0	4.4	0
21	103		N	0	1	1	3	0	0	0	0	0	44.0	4.1	0
22	104		N	0	0	1	2	0	0	0	0	0	43.0	3.8	0
23	107		N	0	0	0	3	0	0	0	0	0	40.0	4.2	0
24	99		N	0	0	0	3	0	0	0	0	0	39.0	4.9	0
25	102		N	0	0	0	3	0	0	0	0	0	38.0	4.5	0
26	113		N	0	1	1	2	0	0	0	0	0	43.0	3.2	0
27	110		N	0	1	2	3	0	0	0	0	0	44.0	4.5	0
28	106		N	0	1	1	3	3	0	0	0	0	34.0	4.3	0
29	107		N	0	1	1	2	0	0	0	0	0	46.0	4.2	0

eyes = eyes  
gill = gills  
psbr = pseudobranch  
thym = thymus  
fat = fat (pyloric caeca)  
spl n = spleen  
intn = intestine

kidn = kidney  
livr = liver,  
mesn = mesentery  
hema = hematocrit  
spro = serum protein  
oper = operculum

ad = adipose fin clipped  
**nec** tiss = necrotic tissue  
**ex** (yellw) fat = excess (yellow) fat  
wht spt = white spots  
pet hem = petechial hemorrhage  
swoln = swollen

Percent in Each Category

	N/O	1	2	3	4	5	6
ves	100	-	-	-	-	-	-
11	97					3	
pseudobranch	38	62	-	-	-	-	-
ymus	38	52	10	-	-	-	-
it			52	48	-	-	-
bleen	93	-	-	7	-	-	-
testine	100	-	-	-	-	-	-
dney	100	-	-	-	-	-	-
iver	100	-	-	-	-	-	-
esentery	100	-	-	-	-	-	-
erculum	100	-	-	-	-	-	-

	Length	Weight	Hematocrit	Serum	Protein
AVERAGE	107.9655	11.82758	39.72413	4.203448	
STD DEV	6.343515	0	3.333699	0.384602	
C OF V	0.058755	0	0.083921	0.091496	
K FACTOR	0.000009				
C FACTOR	0.000339				

**Batchery:** Spring Creek NFH Date: **5/16/90** Pond No: 21  
 May Release Diet Study Diet: BI ODRY Sample Size: 29  
 Code: 5-23-35

fish no.	Ln.	Wt. mm	e g p t f s i k l m h s o									
				y i s h a p n i e	e	P	P	r	e			
s l r m	n n n r n	a	0	r								
1	104	148	N 0 1 0 2 0 0 0 0 0 0 0 0	37.0	3.8	0	<b>nec</b>	tiss	gills			
2	103		N 0 1 1 2 0 0 0 0 0 0 0 0	37.5	4.1	0						
3	99		<b>N 0 0 0 2 0 0 0 0 0 0 0 0</b>	30.0	4.0	0	<b>nec</b>	tiss	gills, yol k sac			
4	102		N 0 1 1 2 0 0 0 0 0 0 0 0	35.0	3.3	0	<b>nec</b>	tiss	gills			
5	93		N 0 1 1 2 0 0 0 0 0 0 0 0	41.0	4.1	0	<b>nec</b>	tiss/wht spts	gills			
6	109		N 0 1 1 2 0 0 0 0 0 0 0 0	40.0	4.1	0	<b>nec</b>	tiss	gills			
7	111		N 4 1 1 3 0 0 0 0 0 0 0 0	28.5	3.5	0	<b>nec/wht</b>	spts	gills, anal	8	back	kd <b>her</b>
8	110		N 4 0 0 3 0 0 0 0 0 0 0 0	37.0	4.1	0	<b>nec</b>	tiss	gills			
9	109		N 5 0 1 3 0 0 0 0 0 0 0 0	40.0	4.1	0	ad					
10	95		N 0 0 0 2 4 0 0 0 0 0 0 0	34.0	3.5	0	<b>nec</b>	tiss	gills, wht spts	<b>gills/thym</b>		
11	97		N 0 1 0 2 0 0 0 0 0 0 0 0	39.0	4.0	0	Ich,	<b>nec</b>	tiss	gills		
12	111		N 0 1 0 2 0 0 0 0 0 0 0 0	38.0	3.8	0	Ich					
13	106		N 0 1 1 3 0 0 0 0 0 0 0 0	38.0	4.1	0	Ich,	<b>nec</b>	tiss/wht	spts	gills	
14	103		N 0 0 1 3 0 0 0 0 0 0 0 0	33.0	4.0	0	Ich,	wht	spts	<b>gills/thym</b>		
15	109	176	N 0 1 0 3 3 0 0 0 0 0 0 0	39.0	3.9	0	<b>nec</b>	tiss	gills, spleen hem,	yol k sac		
16	114		N 0 0 1 2 0 0 0 0 0 0 0 0	37.0	4.1	0	<b>ex</b>	yllw	fat	pyloric		
17	113		N 0 0 1 2 0 0 0 0 0 0 0 0	36.0	4.5	0	<b>nec</b>	tiss	gills			
18	105		N 0 1 0 3 0 0 0 0 0 0 0 0	42.0	4.1	0	<b>nec</b>	tiss	gills, ex	yllw	fat	pyloric
19	111		N 4 0 0 2 0 0 0 0 0 0 0 0	38.0	4.2	0	<b>nec</b>	tiss/wht	spts	gills		
20	110	<b>B1</b>	0 0 2 2 0 0 0 0 0 0 0 0	42.0	4.2	0	<b>nec</b>	tiss	gills			
21	114		N 0 0 0 2 0 0 0 0 0 0 0 0	39.0	4.3	0	<b>nec</b>	tiss/wht	spts	gills		
22	106		N 0 1 1 3 0 0 0 0 0 0 0 0	41.0	4.3	0	<b>nec</b>	tiss	gills, wht	spts	thym	
23	95		N 0 0 0 3 0 0 0 0 0 0 0 0	34.5	4.0	0						
24	111		N 0 0 1 3 0 0 0 0 0 0 0 0	36.0	4.0	0	nec	tiss	gills			
25	109		N 0 0 0 3 3 0 0 0 0 0 0 0	35.0	4.1	0	nec	tiss	gills, wht	spts	gills/thym	
26	111		N 0 1 0 3 0 0 0 0 0 0 0 0	41.0	4.1	0	Ich,	<b>nec</b>	tiss	gills		
27	101		N 0 1 1 3 0 0 0 0 0 0 0 0	39.0	4.2	0	Ich,	ad,	<b>nec</b>	tiss	gills	
28	102		N 0 1 0 3 0 0 0 0 0 0 0 0	43.0	3.9	0	Ich,	wht	spts	<b>gills/thymus</b>		
29	106		N 0 0 0 3 0 0 0 0 0 0 0 0	46.0	4.2	0	Ich,	ad,	<b>nec</b>	tiss	gills	

eyes	= eyes	kidn	= kidney
gill	= gills	livr	= liver
psbr	= pseudobranch	<b>mesn</b>	= mesentery
thym	= thymus	<b>hema</b>	= hematocrit
fat	= fat (pyloric <b>caeca</b> )	spro	= serum protein
spln	= spleen	oper	= operculum
intn	= intestine		

ad = adipose fin clipped  
**nec** tiss = necrotic tissue  
**ex** (yllw) fat = excess (yellow) fat  
 wht spt = white spots  
 pet hem = petechial hemorrhage  
**swoln** = swollen

Percent in Each Category

	N/O	1	2	3	4	5	6	B1
yes	97	-	-					3
ill	86	-	-		10	3	0	
seudobranch	48	52	-					
hymus			3					
at	52	45	48	52				
pleen	90	-	-	7	3			
ntestine	100	-	-			-		
dney	100	-	-			-		
iver	100	-	-			-		
esentery	100	-	-			-		
perculum	100	-	-			-		

	Length	Weight	Hematocrit	Serum	Protein
AVERAGE	105.8275	11.17241	37.81034	4.020689	
STD DEV	5.843174	0	3.693922	0.246883	
C OF V	0.055214	0	0.097696	0.061403	
K FACTOR	0.000009				
C FACTOR	0.000340				

Catchery: Spring Creek NFH Date: 5/14/90 Pond No: 22  
 May Release Diet Study Diet: BIOLOGY Sample Size: 8  
 Code: 5-23-36

	eg	pt	f	si	k	l	m	h	s	o
	y i	s h a	p n i	i e	e e			p	p	
ish	Ln.	Wt.	el	b y	t l	t d	v s	m	r	e
10.	mm	gm	s l	r m	n n	n r	n a	0	r	Remarks

1	115	91	N	0	1	1	2	0	0	0	0	41.0	4.0	0	nec.	tis.	gills
2	98		N	0	0	0	3	0	0	0	0	42.0	4.6	0	nec.	tis.	gills, yolk sac
3	90		N	0	1	1	3	0	0	0	0	37.0	4.0	0	<b>nec.</b>	tis.	gills
4	99		N	0	1	0	2	0	0	0	0	44.0	4.6	0	<b>nec.</b>	tis.	gills
5	111		N	0	0	1	3	0	0	0	0	41.0	4.3	0	<b>nec.</b>	tis.	gills
6	107		N	0	0	0	3	0	0	0	0	44.0	3.6	0	ad,	Ich,	<b>nec.</b> tis. gills
7	113		N	0	1	1	2	0	0	0	0	40.0	3.6	0	Ich,	<b>nec.</b>	tis. gills
8	109		N	0	0	0	2	0	0	0	0	36.0	3.9	0	<b>nec.</b>	tis.	gills

eyes	=	eyes	ki dn	=	ki dney
gill	=	gills	livr	=	livcr
psbr	=	pseudobranch	mesn	=	mesentery
thym	=	thymus	<b>hema</b>	=	hematocrit
fat	=	fat ( <i>pyloric caeca</i> )	<b>spro</b>	=	serum protein
<b>sp1n</b>	=	spleen	<b>oper</b>	=	<b>operculum</b>
intn	=	intestine			

Percent in Each Category

	N/0	1	2	3	4	5	6
<b>yes</b>	100						
ill	100						
seudobranch	50	50					
hymus	50	50					
at							
pleen	100						
ntestine	<b>100</b>						
i dney	100						
i ver	100						
<b>esentery</b>	100						
<b>perculum</b>	100						

	Length	Weight	Hematocrits	Serum	Protein
<b>verage</b>	105.25	11.375	40.625		4.075
td. Dev.	' 8.135570	0	2.735758		0.369966
of v	0.077297	0	0.067341		0.090789
Factor	0.000009				
Factor	0.000352				

SUMMARY OF CODE S-23-36 AND 5-23-35  
 SPRING CREEK NFH, MAY RELEASE

	N/O	1	2	3	4	5	6	81
EYES	98.95			"				1.05
GI LL	93.68			"	4.21	2.11	"	
PSBR	<b>44.21</b>	55.79		"				
THYM	<b>47.37</b>	<b>46.32</b>	6.32	"				
FAT		"	37.89	62.11				
SPLN	93.68	"		5.26	1.05			
INTN	100.00	"						
KIDN	100.00	"						
LIVR	100.00			"				
MESN	98.95	1.05		"				
OPER	100.00		"	"				

	LENGTH	WEIGHT	HEMATOCRIT	SERUM PROTEIN
AVERAGE	<b>106.7521</b>	<b>11.6196</b>	<b>39.0399</b>	<b>4.12047</b>
STD DEV	6.973704		3.016949	0.349512
C OF V	<b>0.065351</b>		<b>0.077400</b>	<b>0.084626</b>
K FACTOR	0.000009			
C FACTOR	<b>0.0003445</b>			

**atchery:** Spring Creek NFH Date: **5/16/90** Pond No: 20  
 May Release Diet Study Diet: ABERDRY Sample Size: 29  
 Code: 5-22-16

		eg	pt	f	s	i	k	l	m	h	s	o
ish	Ln.	Wt.	y	i	s	h	a	p	n	e	p	p
no.	mm	gm	el	b	y	t	l	t	d	v	s	r
1	104	167	N	0	1	0	2	4	0	0	0	35.0
2	108		N	0	1	1	2	4	0	0	0	43.0
3	114		N	0	1	1	2	0	0	0	0	36.0
4	116		N	0	1	0	2	0	0	0	0	43.0
5	118		N	0	1	0	2	0	0	0	0	38.0
6	105		N	0	1	0	2	4	0	0	1	36.0
7	113		N	0	1	2	2	0	0	0	0	34.0
8	109		N	0	0	1	2	0	0	0	0	37.0
9	108		N	0	0	0	2	0	0	0	0	40.0
10	105		N	0	0	1	2	3	0	0	0	37.5
11	110		N	0	1	1	2	0	0	0	0	41.0
12	107		N	0	1	2	3	0	0	0	0	38.0
13	102		N	0	1	1	2	0	0	0	0	40.0
14	103		N	0	1	1	3	0	0	0	0	38.5
15	113	189	N	0	1	1	2	0	0	0	0	42.0
16	116		N	0	1	0	3	0	0	0	0	37.0
17	96		N	0	1	1	2	0	0	0	0	44.0
18	110		N	0	1	0	2	0	0	0	0	41.0
19	117		N	0	1	1	2	0	0	0	0	42.0
20	107		N	0	1	1	3	0	0	0	0	38.5
21	119		N	0	1	1	2	3	0	0	0	46.0
22	115		N	0	1	0	2	0	0	0	0	42.0
23	111		N	0	1	0	3	0	0	0	0	42.0
24	110		N	0	1	1	3	0	0	0	0	40.0
25	111		N	0	1	1	3	0	0	0	0	38.0
26	95		N	0	0	0	3	0	0	0	0	44.0
27	100		N	0	1	0	3	0	0	0	0	43.0
28	111		N	0	1	1	2	3	0	0	0	40.0
29	114		N	0	0	1	2	0	0	0	0	43.0

eyes	= eyes	ki dn	=	kidney
gill	= gills	livr	=	liver
psbr	= pseudobranch	<b>mesn</b>	=	mesentery
thym	= thymus	<b>hema</b>	=	hematocrit
fat	= fat ( <b>pyloric caeca</b> )	spro	=	serum protein
spl n	= spleen	oper	=	operculum
int n	= intestine			

ad = adipose fin clipped  
**nec** tiss = necrotic tissue  
 ex (yellw) fat = excess (yellow) fat  
 wht spt = white spots  
 pet hem = petechial hemorrhage  
 swoln = swollen

Percent in Each Category

	N/0	1	2	3	4	5	6
<b>y e s</b>	100						
<b>i l l</b>	100						
seudobranch	17	<b>83</b>					
hymus	38	<b>55</b>	7				
at			69	31	-		
<b>s p l e e n</b>	79			10	10		
intestine	100						
<b>k i d n e y</b>	100						
liver	100						
mesentery	97	3	-				
<b>i p e r c u l u m</b>	100						

	Length	Weight	Hematocrit	Serum	Protein
AVERAGE	109.2068	12.27586	39.98275	4.144827	
STD DEV	6.082078	0	2.969624	0.752735	
C OF V	0.055693	0	0.074272	0.181608	
K FACTOR	0.000009				
C FACTOR	0.000340				

Percent in Each Category

	N/O	1	2	3	4	5	6
<b>yes</b>	100	-	-	-			
, 111	86	-	-	-	7	7	-
' seudobranch	72	28	-	-			
<b>hymus</b>	31	62	7	-			
at			45	55	-		-
<b>ipleen</b>	86	-	-	3	10		-
ntestine	100	-	-	-			-
<b>kidney</b>	100	-	-	-			-
<b>iver</b>	97	-	3	-			-
<b>lesentery</b>	100	-	-	-			-
<b>perculum</b>	100						-

	Length	Weight	Hematocrit	Serum	Protein
AVERAGE	106.8965	11.7586' 2	40.46551	4.213793	
STD DEV	<b>6.227551</b>	0	3.329417	0.312635	
C OF V	0.058257	0	0.082277	0.074193	
K FACTOR	0.000009				
C FACTOR	0.000347				

Table 4. **Summary** of Current Health Status of Production **Fish** at **Service** Facilities

<b>FACILITY</b>	<b>FISH STOCK</b>	<b>HEALTH STATUS</b>
Abernathy Salmon Culture Technical Cntr.	Tule fall chinook salmon	Adult prevalence of <u>C. shasta</u> @ 30%; BKD causing losses in some smolts at release
Carson National fish Hatchery	Spring chinook salmon	Light IHN losses early in 1990 smolts; EIBS @ 50% in February; clinical BKD in trout in Tyee Spr. water supply; BKD prevalence 2% in 1990 smolts
	Summer steelhead trout	IHN losses down to 15% in 1990; Ich required treatment
Dworsnak National Fish Hatchery	Spring chinook salmon	Coleman strain IHN virus detected in juveniles; BKD+popeye in some CWT fish; BKD prevalence 13% in smolts; EIBS detected for first time
	Coho salmon	Coldwater disease caused 2-5% loss; treatments required
Eagle Creek National Fish Hatchery	Winter steelhead trout	Adult prevalence of <u>C. shasta</u> @ 18%; juveniles healthy
Entiat National Fish Hatchery	Spring chinook salmon	BKD avg. 47% prevalence, 97% in fish held in brood pond; <u>Myxobolus</u> spores in brains of 100% of fish
		Healthy fish
Hagerman National Fish Hatchery	Summer steelhead trout	IHN caused destruction of fish in one raceway; ERM caused low level losses
Kooskia National Fish Hatchery	Spring chinook salmon	BKD 7% prevalence; BKD+popeye in some CWT fish; Ich and ERM required treatment
	Summer steelhead trout	High fry loss to heterotrophic bacteria in reuse system
Leavenworth National Fish hatchery	Spring chinook salmon	BKD 18% prevalence; low levels of ERM
	Sumner steelhead trout	Brood year '89 - BCWD otherwise healthy fish; BY '90 destroyed due to IPN in adult brood stock
	Kokanee	Healthy fish

Table 4. Summary of Current Health Status of Production Fish (Continued)

FACILITY	FISH STOCK	HEALTH STATUS
Little White Salmon National Fish Hatch. Spring chinook salmon	Bright fall chinook salmon	No BKD detected in 1990 smolts
	Coho salmon (adults only)	Adults positive for IHNV (40%) and <u>C. shasta</u> (60%); juveniles healthy
	Tule fall chinook salmon	In fish tested: IHN (25%); EIBS (0%); <u>C. shasta</u> (80%); BKD (23%)
Spring Creek National Fish Hatchery		Healthy fish; persistent Ich required treatments; BKD detected in Aprii and Way release
Warm Springs National Fish Hatchery	Spring chinook salmon	BKD prevalence 8%; wide variety of internal and external parasites
	Rainbow trout	IPN forced destruction of lot; replacements from ODF&W healthy
Willard National Fish Hatchery	Coho salmon	Coldwater disease moderate to severe annually; BKD+++ in most smolt markets
Winthrop National Fish Hatchery	Spring chinook salmon	BKD prevalence at 37%; overcrowding; recurrent bacterial gill disease requires frequent treatment
	Kokanee	Bacterial gill disease

CASE HISTORY SUMMARYCOLUMBIA RIVER BASIN NATIONAL FISH HATCHERIES

January 1, 1989 - May 15, 1990

In compliance with the requirements of an interagency agreement (DE-AI79 BP355851 on "Augmented Fish Health Monitoring, between the U. S. Fish and Wildlife Service (Service) and the Bonneville Power Administration (BPA), the Service has collected and recorded fish health case history information in a computerized data base. Data from monthly diagnostic visits and other fish disease monitoring work is included.

The following tables summarize case history data for calendar year 1988 as required in contract Task 6.1. At first glance the attached tables are somewhat cryptic. A complete set of definitions is appears at the end of this report as Appendix II. Most items in the ten column report are self-explanatory. These items and a brief explanation are as follows:

1. DATE - Self-explanatory
2. LOCATION - Derived from interagency locator systems, for example:  
 Idaho: 16 + Idaho hatchery 95 = 1695 + DWOR = 1695DWOR (Dworshak NFH)  
 Oregon: 43 + Oregon hatchery 98 = 4398 + WMSP = 4398WMSP (Warm Springs NFH)  
 Washington: 53 + Washington hatchery 33 = 5339 + CRSN = 5399CRSN (Carson NFH)
3. SPE - Species of fish. A three-letter code that is usually self-explanatory:  
 URB = Upriver bright fall chinook salmon  
 WST = Winter steelhead trout  
 SST = Summer steelhead trout
4. FISH/LB - Number of fish per pound
5. AGE - A letter code indicating age of fish. E = Eggs; S = Sac fry (hatched fry usually > 1,000 per pound); F = Fingerling (usually <=1,000 per pound and > 25 per pound; Y = Yearlings (usually hatchery juveniles <= 25 per pound; B = All spawning adults.
6. DEN-IND - Density index calculated as directed by Piper, et al (1982)
7. FLOW-IND - Flow index calculated as directed by Piper, et al (1982)

8. TEMP - Water temperature in degrees Fahrenheit
9. DIS - Disease or pathogens detected. See Appendix II for full listing. Codes for bacterial diseases begin with the letter "B"; Most names of external parasites begin with the letter "P"; Most viral diseases begin with "V"; **Sporozoans** begin with "S". Therefore:
  - BK = Bacterial kidney disease
  - BW = Coldwater disease
  - PICH = Ichthyophthirius
  - PCOS = Costia (now Ichthyobodo)
  - SW = Myxobolus cerebralis
  - SP = Proliferative kidney disease
  - VH= Infectious hematopoietic necrosis
  - VN = Erythrocytic inclusion body syndrome

10. LOSS/MO - Projected percentage loss per month for case reported.

# 1989-90 CASE HISTORY SUMMARY

ABERNATHY SALMON CULTURE TECHNICAL CENTER

## FISH AND WILDLIFE SERVICE FISH DISEASE SUMMARY

DATE	LOCATION	SPE	FISH/LB	AGE	DEN-IND	FLOW-IND	TEMP	DIS	LOSS/MO
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01/10/89	5399ABER	FCS	700.00	F	0.21	0.67	41.0	xx	0.05
02/08/89	5399ABER	FCS	130.00	F	0.11	0.34	51.0	xx	0.00
03/13/89	5399ABER	FCS	160.00	F	0.21	0.42	42.0	XX	0.00
03/21/89	5399ABER	FCS	60.00	F	0.19	0.57	51.0	xx	0.00
04/10/89	5399ABER	FCS	38.00	F	0.25	0.77	59.0	xx	0.00
04/20/89	5399ABER	FCS	56.00	F	0.21	0.63	59.0	xx	0.00
09/18/89	5399ABER	FCS	0.05	B	0.00	0.00	0.0	BK	0.00
09/18/89	5399ABER	FCS	0.05	B	0.00	0.00	0.0	BF	0.00
09/18/89	5399ABER	FCS	0.05	B	0.00	0.00	0.0	SC	0.00
01/04/90	5399ABER	FCS	330.00	F	0.34	1.05	50.0	PCOS	1.40
01/04/90	5399ABER	FCS	330.00	F	0.34	1.05	50.0	BA	1.40
01/04/90	5399ABER	FCS	330.00	F	0.34	1.05	50.0	UW	1.40
01/18/90	5399ABER	FCS	190.00	F	0.26	0.56	43.0	BW	0.50
04/30/90	5399ABER	FCS	50.00	F	0.30	0.81	50.0	BK	1.16
04/30/90	5399ABER	FCS	22.80	Y	0.17	0.46	59.0	BK	1.71
05/09/90	5399ABER	FCS	39.00	F	0.32	0.82	50.0	BK	1.00

CARSON NATIONAL FISH HATCHERY

DATE	LOCATION	SPE	FISH/LB	AGE	DEN-IND	FLOW-IND	TEMP	DIS	LOSS/MO
01/03/89	5399CRSN	SCS	30.30	F	0.26	0.84	44.0	VN	0.02
01/12/89	5399CRSN	SCS	29.00	F	0.27	0.87	43.0	XX	0.03
02/15/89	5399CRSN	SCS	683.00	F	0.32	0.82	43.0	XX	0.59
02/15/89	5399CRSN	SCS	26.00	F	0.29	0.93	43.0	VN	0.03
03/06/89	5399CRSN	SCS	24.00	Y	0.29	0.99	44.0	NC	0.00
03/06/89	5399CRSN	SCS	24.00	Y	0.29	0.99	44.0	VN	0.00
03/10/89	5399CRSN	SCS	470.00	F	0.41	0.82	44.0	XX	0.00
04/10/89	5399CRSN	SCS	20.00	Y	0.33	1.12	44.0	VN	0.00
04/10/89	5399CRSN	SCS	20.00	Y	0.33	1.12	44.0	PSCY	0.00
04/10/89	5399CRSN	SCS	20.00	Y	0.33	1.12	44.0	VH	0.00
05/02/89	5399CRSN	SCS	142.00	F	0.34	1.38	44.0	FP'	0.00
06/12/89	5399CRSN	SCS	88.00	F	0.23	0.94	44.0	xx	0.20
07/06/89	5399CRSN	SCS	78.00	F	0.14	0.45	45.0	FP	0.13
07/20/89	5399CRSN	SCS	0.07	B	0.00	0.00	47.0	SC	0.00
07/20/89	5399CRSN	SCS	0.07	B	0.00	0.00	47.0	BK	0.00
07/20/89	5399CRSN	SCS	0.07	B	0.00	0.00	47.0	FS	0.00
08/02/89	5399CRSN	SCS	62.00	F	0.16	0.66	46.0	XX	0.06
08/08/89	5399CRSN	SCS	0.07	B	0.00	0.00	45.0	SC	0.00
08/08/89	5399CRSN	SCS	0.07	B	0.00	0.00	45.0	BK	0.00
08/08/89	5399CRSN	SCS	0.07	B	0.00	0.00	45.0	VH	0.00
08/08/89	5399CRSN	SCS	0.07	B	0.00	0.00	45.0	BF	0.00
08/08/89	5399CRSN	SCS	0.07	B	0.00	0.00	45.0	BR	0.00
09/06/89	5399CRSN	SCS	44.00	F	0.24	1.19	45.0	VH	1.00
10/05/89	5399CRSN	SCS	36.00	F	0.27	1.21	44.0	VH	0.10
10/05/89	5399CRSN	SCS	36.00	F	0.27	1.21	44.0	PSCY	0.10
11/09/89	5399CRSN	SCS	32.00	F	0.25	1.26	44.0	BK	0.05
01/12/90	5399CRSN	SCS	30.00	F	0.26	0.84	44.0	BK	0.04
01/12/90	5399CRSN	SCS	30.00	F	0.26	0.84	44.0	VN	0.04
02/02/90	5399CRSN	SCS	28.00	F	0.27	0.88	44.0	VN	0.04
02/28/90	5399CRSN	SCS	24.30	Y	0.30	0.97	44.0	VN	0.06
03/16/90	5399CRSN	SCS	350.00	F	0.38	1.35	44.0	FP	0.20
03/16/90	5399CRSN	SCS	21.50	Y	0.33	1.05	44.0	BK	0.06

DWORSHAK NATIONAL FISH HATCHERY

DATE	LOCATION	SPE	FISH/LB	AGE	DEN-IND	FLOW-IND	TEMP	DIS	LOSS/MO
01/03/89	1695DWOR	SCS	22.50	Y	0.27	0.70	43.6	UE	23.00
01/03/89	1695DWOR	SCS	22.50	Y	0.27	0.70	43.6	PEP1	23.00
01/03/89	1695DWOR	SCS	22.50	Y	0.27	0.70	43.6	PSCY	23.00
01/03/89	1695DWOR	SCS	22.50	Y	0.27	0.70	43.6	PTRC	23.00
01/03/89	1695DWOR	SCS	22.50	Y	0.27	0.70	43.6	PTRY	23.00
01/06/89	1695DWOR	SST	8.90	Y	0.23	0.80	49.0	PICH	0.73
01/06/89	1695DWOR	SST	8.90	Y	0.25	0.80	49.0	PICH	0.58
01/09/89	1695DWOR	SST	6.90	Y	0.13	0.80	49.0	XX	1.10
01/09/89	1695DWOR	SST	7.40	Y	0.19	0.80	49.0	PICH	0.70
01/09/89	1695DWOR	SCS	135.90	F	0.03	0.02	53.5	UE	0.28
01/09/89	1695DWOR	SST	6.02	Y	0.26	0.79	52.6	PICH	0.84
01/09/89	1695DWOR	SST	6.02	Y	0.26	0.79	52.6	TG	0.84
01/09/89	1695DWOR	SST	7.52	Y	0.18	0.79	52.6	TG	0.39
01/09/89	1695DWOR	SST	7.52	Y	0.18	0.79	52.6	PICH	0.39
01/13/89	1695DWOR	SST	7.47	Y	0.22	0.79	52.6	PEPI	0.31
01/13/89	1695DWOR	SST	7.52	Y	0.18	0.79	52.6	PEP1	0.39
01/15/89	1695DWOR	SST	8.90	Y	0.23	0.80	49.0	PICH	0.73
01/15/89	1695DWOR	SCS	22.35	Y	0.23	0.80	40.5	UE	0.97
01/17/89	1695DWOR	SST	8.90	Y	0.25	0.80	49.0	PICH	0.58
01/17/89	1695DWOR	SST	8.90	Y	0.23	0.80	49.0	PICH	0.73
01/19/89	1695DWOR	SST	82.39	F	0.06	0.18	53.4	VH	3.93
01/20/89	1695DWOR	SCS	19.60	Y	0.27	0.80	40.5	PTRC	0.06
01/20/89	1695DWOR	SCS	19.60	Y	0.27	0.80	40.5	UE	0.06
02/01/89	1695DWOR	SCS	534.00	F	0.00	0.00	0.0	UE	0.00
02/01/89	1695DWOR	SCS	647.00	F	0.00	0.00	0.0	UE	0.00
02/08/89	1695DWOR	SST	5.94	Y	0.15	0.84	48.0	XX	0.50
02/08/89	1695DWOR	SST	6.73	Y	0.22	0.92	50.2	XX	0.38
02/10/89	1695DWOR	SCS	20.60	Y	0.24	0.80	37.8	UE	1.07
02/10/89	1695DWOR	SCS	20.60	Y	0.24	0.80	37.8	PTRY	1.07
02/10/89	1695DWOR	SCS	20.80	Y	0.28	0.80	37.8	PEP1	0.21
02/10/89	1695DWOR	SCS	20.80	Y	0.28	0.80	37.8	PTRY	0.21
02/10/89	1695DWOR	SCS	20.80	Y	0.28	0.80	37.8	UE	0.21
02/13/89	1695DWOR	SST	6.99	Y	0.27	0.84	48.0	PICH	4.96
02/13/89	1695DWOR	SST	6.99	Y	0.27	0.84	48.0	PEP1	4.96
02/13/89	1695DWOR	SST	6.99	Y	0.27	0.84	48.0	BG	4.96
02/13/89	1695DWOR	SST	6.99	Y	0.27	0.84	48.0	PAMB	4.96
02/13/89	1695DWOR	SST	6.99	Y	0.26	0.84	48.0	PICH	2.65
02/13/89	1695DWOR	SST	6.99	Y	0.26	0.84	48.0	PEP1	2.65
02/13/89	1695DWOR	SST	6.99	Y	0.26	0.84	48.0	BG	2.65
02/15/89	1695DWOR	SST	6.99	Y	0.24	0.84	48.0	PICH	3.81
02/15/89	1695DWOR	SST	6.99	Y	0.24	0.84	48.0	PEPI	3.81
02/15/89	1695DWOR	SST	6.99	Y	0.24	0.84	48.0	BG	3.81
02/16/89	1695DWOR	SCS	17.36	Y	0.28	0.80	37.8	UE	1.33
02/16/89	1695DWOR	SCS	17.36	Y	0.28	0.80	37.8	PEP1	1.33
02/16/89	1695DWOR	SCS	17.36	Y	0.28	0.80	37.8	PTRC	1.33
02/16/89	1695DWOR	SCS	17.36	Y	0.28	0.80	37.8	PTRY	1.33
02/16/89	1695DWOR	SCS	17.36	Y	0.28	0.80	37.8	BK	1.33
02/16/89	1695DWOR	SCS	20.60	Y	0.29	0.80	37.8	PTRC	0.30
02/16/89	1695DWOR	SCS	20.60	Y	0.29	0.80	37.8	PTRY	0.30
02/16/89	1695DWOR	SCS	26.60	F	0.29	0.80	37.8	PEP1	0.30

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FISH AND WILDLIFE SERVICE  
FISH DISEASE SUMMARY

DATE LOCATION SPE FISH/LB AGE DEN-IND FLOW-IND TEMP DIS LOSS/MO

02/16/89	1695DWOR	SCS	26.60	F	0.29	0.80	37.8	UE	0.30
02/27/89	1695DWOR	SCS	22.02	Y	0.25	0.80	37.8	UE	0.20
02/27/89	1695DWOR	SCS	22.02	Y	0.25	0.80	37.8	PEP1	0.20
02/27/89	1695DWOR	SCS	22.02	Y	0.25	0.80	37.8	PTRY	0.20
02/27/89	1695DWOR	SCS	18.23	Y	0.27	0.80	37.8	PEPI	0.10
02/27/89	1695DWOR	SCS	18.23	Y	0.27	0.80	37.8	PTRY	0.10
02/27/89	1695DWOR	SCS	20.73	Y	0.24	0.80	37.6	PEP1	0.79
02/27/89	1695DWOR	SCS	20.73	Y	0.24	0.88	37.8	UE	0.79
02/27/89	1695DWOR	SCS	20.73	Y	0.24	0.88	37.8	PTRY	0.79
03/01/89	1695DWOR	SCS	15.48	Y	0.16	0.14	37.8	LIE	1.54
03/01/89	1695DWOR	SCS	15.48	Y	0.16	0.14	37.8	PEP1	1.54
03/01/89	1695DWOR	SCS	15.48	Y	0.16	0.14	37.8	PSCY	1.54
03/01/89	1695DWOR	SCS	15.48	Y	0.16	0.14	37.8	PCOS	1.54
03/01/89	1695DWOR	SCS	15.48	Y	0.16	0.14	37.8	BG	1.54
03/08/89	1695DWOR	SST	5.23	Y	0.16	0.90	46.0	PEP1	0.25
03/08/89	1695DWOR	SST	5.23	Y	0.16	0.90	46.0	PSCY	0.25
03/09/89	1695DWOR	SCS	15.48	Y	0.17	0.14	37.8	PTRY	1.54
03/09/89	1695DWOR	SCS	15.48	Y	0.16	0.14	37.8	PTRY	3.01
03/09/89	1695DWOR	SCS	15.48	Y	0.16	0.14	37.8	PCOS	3.01
03/09/89	1695DWOR	SCS	15.48	Y	0.16	0.14	37.8	BK	3.01
03/13/89	1695DWOR	SCS	256.00	F	0.63	0.00	38.7	UE	0.25
03/24/89	1695DWOR	SST	5.23	Y	0.16	0.90	46.0	PTRC	3.01
03/24/89	1695DWOR	SST	5.23	Y	0.16	0.90	46.0	PEP1	3.01
03/24/89	1695DWOR	SST	5.23	Y	0.16	0.90	46.0	VH	3.01
03/27/89	1695DWOR	SCS	219.00	F	0.64	0.00	38.7	XX	2.14
03/29/89	1695DWOR	SCS	22.71	Y	0.22	0.80	37.8	BK	1.47
04/06/89	1695DWOR	SST	4.97	Y	0.19	0.53	42.0	TG	0.11
04/06/89	1695DWOR	SST	4.97	Y	0.19	0.53	42.0	PEPI	0.11
04/06/89	1695DWOR	SST	4.97	Y	0.15	0.53	42.0	PTRC	0.11
04/17/89	1695DWOR	SCS	180.00	F	0.25	0.00	40.0	UE	13.50
04/17/89	1695DWOR	SCS	180.00	F	0.25	0.00	40.0	PCOS	13.50
04/27/89	1695DWOR	RBT	16.64	Y	0.24	0.54	57.0	PSCY	0.00
04/27/89	1695DWOR	RBT	16.64	Y	0.24	0.54	57.0	VH	0.00
05/12/89	1695DWOR	SCS	193.00	F	0.17	0.00	39.7	UE	1.13
05/12/89	1695DWOR	SCS	193.00	F	0.17	0.00	39.7	BK	1.13
05/17/89	1695DWOR	SST	12.00	Y	0.00	0.00	40.0	VH	0.00
05/17/89	1695DWOR	SST	12.00	Y	0.00	0.00	40.0	VN	0.00
05/17/89	1695DWOR	SST	12.00	Y	0.00	0.00	40.0	VP	0.00
05/17/89	1695DWOR	SST	12.00	Y	0.00	0.00	40.0	UE	0.00
05/17/89	1695DWOR	SST	12.00	Y	0.00	0.00	40.0	BK	0.00
05/17/89	1695DWOR	SST	12.00	Y	0.00	0.00	40.0	BR	0.00
05/17/89	1695DWOR	SST	12.00	Y	0.00	0.00	40.0	SC	0.00
05/17/89	1695DWOR	SCS	168.50	F	0.13	0.00	39.7	UE	0.52
05/23/89	1695DWOR	SCS	146.00	F	0.44	0.00	51.0	VH	1.96
06/21/89	1695DWOR	SST	143.00	F	0.18	0.00	50.5	VH	11.74
06/21/89	1695DWOR	SST	215.00	F	0.08	0.04	52.0	VH	0.16
07/05/89	1695DWOR	SST	88.00	F	0.01	0.00	51.8	VH	9.61
07/06/89	1695DWOR	SCS	69.60	F	0.14	0.50	51.5	BK	0.21
07/06/89	1695DWOR	SCS	70.10	F	0.13	0.50	51.5	BK	2.04
07/06/89	1695DWOR	SCS	76.35	F	0.14	0.50	51.5	BK	0.53

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07/06/89	1695DWOR	SCS	75.00	F	0.12	0.50	51.5	BK	2.47
07114189	1695DWOR	SST	879.00	F	0.24	0.00	50.5	VH	0.00
07/17/89	1695DWOR	SST	702.67	F	0.18	0.00	50.5	VH	26.70
07117189	1695DWOR	SST	0.00	F	0.00	0.00	50.5	VH	0.00
07/19/89	<b>1695DWOR</b>	SCS	65.90	F	0.13	0.50	52.0	BK	1.71
07/26/89	1695DWOR	SCS	150.30	F	0.12	0.50	51.5	PEP1	1.04
07/26/89	1695DWOR	SCS	150.30	F	0.12	0.50	51.5	PSCY	1.04
07/26/89	1695DWOR	SCS	150.30	F	0.12	0.50	51.5	UE	1.04
07/26/89	1695DWOR	SCS	150.30	F	0.12	0.50	51.5	BK	1.04
07/26/89	1695DWOR	SCS	159.30	F	0.26	0.50	51.5	UE	0.85
07/26/89	1695DWOR	SCS	159.30	F	0.26	0.50	51.5	PSCY	0.85
07/26/89	<b>1695DWOR</b>	SCS	159.30	F	0.26	0.50	51.5	PEPI	0.85
07/26/89	1695DWOR	SCS	159.30	F	0.26	0.50	51.5	BK	0.85
07/26/89	1695DWOR	SCS	166.20	F	0.23	0.50	51.5	UE	0.00
07/26/89	1695DWOR	SCS	166.20	F	0.23	0.50	51.5	BK	0.00
07/31/89	1695DWOR	SCS	74.00	F	0.12	0.50	51.5	PEP1	0.13
07131189	1695DWOR	SCS	74.00	F	0.12	0.50	51.5	PSCY	0.13
07131189	<b>1695DWOR</b>	SCS	74.00	F	0.12	0.50	51.5	UE	0.13
07/31/89	1695DWOR	SCS	74.00	F	0.12	0.50	51.5	BK	0.13
07/31/89	1695DWOR	SCS	74.70	F	0.21	0.50	51.5	UE	0.11
07/31/89	1695DWOR	SCS	74.70	F	0.21	0.50	51.5	PSCY	0.11
07/31/89	1695DWOR	SCS	74.70	F	0.21	0.50	51.5	BK	0.11
07/31/89	1695DWOR	SCS	74.70	F	0.21	0.50	51.5	PSCY	0.11
07/31/89	1695DWOR	SCS	74.70	F	0.21	0.50	51.5	UE	0.11
07/31/89	1695DWOR	SCS	67.40	F	0.16	0.50	51.5	BK	0.29
07/31/89	1695DWOR	SCS	67.40	F	0.16	0.50	51.5	UE	0.29
07131189	1695DWOR	SCS	67.40	F	0.16	0.50	51.5	PSCY	0.29
07/31/89	1695DWOR	SCS	82.10	F	0.13	0.50	51.5	UE	0.23
07/31/89	1695DWOR	SCS	82.10	F	0.13	0.50	51.5	PSCY	0.23
07/31/89	1695DWOR	SCS	82.10	F	0.13	0.50	51.5	BK	0.23
07/31/89	<b>1695DWOR</b>	SCS	79.60	F	0.13	5.00	51.5	UE	0.31
07/31/89	1695DWOR	SCS	79.60	F	0.13	0.50	51.5	BK	0.31
07/31/89	1695DWOR	SCS	69.80	F	0.13	0.50	51.5	UE	0.23
07/31/89	1695DWOR	SCS	69.80	F	0.13	0.50	51.5	BK	0.23
07/31/89	<b>1695DWOR</b>	SCS	44.00	F	0.16	1.10	52.0	BK	0.00
07/31/89	1695DWOR	SCS	44.00	F	0.16	1.10	52.0	PICH	0.00
07/31/89	1695DWOR	SCS	44.00	F	0.16	1.10	52.0	BK	0.00
08/16/89	1695DWOR	SST	59.00	F	0.11	0.51	53.6	TG	0.96
08116189	1695DWOR	SST	59.00	F	0.11	0.51	53.6	PEPI	0.96
08/16/89	1695DWOR	SST	57.00	F	0.18	0.51	53.6	TG	1.11
08/16/89	1695DWOR	SST	57.00	F	0.18	0.51	53.6	PEPI	1.11
08/16/89	<b>1695DWOR</b>	SST	51.70	F	0.08	0.51	53.6	PEP1	0.00
08/16/89	1695DWOR	SST	51.70	F	0.00	0.51	53.6	PICH	0.00
08/16/89	1695DWOR	SST	51.70	F	0.00	0.51	53.6	PCOS	0.00
08/16/89	1695DWOR	SST	48.00	F	0.10	0.00	53.7	PTRC	12.35
09113189	1695DWOR	SCS	90.90	F	0.30	0.00	53.6	BK	7.74
09113189	1695DWOR	SCS	86.30	F	0.42	0.00	53.6	BK	0.54
09113189	1695DWOR	SCS	86.30	F	0.42	0.00	53.6	PICH	0.54
09113189	1695DWOR	SCS	86.30	F	0.42	0.00	53.6	PEP1	0.54
09/28/89	1695DWOR	SST	26.00	F	0.09	0.59	53.4	TG	0.54

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09/28/89	1695DWOR	SCS	44. 55	F	0.17	0. 50	53. 4	UE	0. 06
09/28/89	1695DWOR	SCS	44. 55	F	0.17	0. 50	53. 4	PEP1	0. 06
09/28/89	1695DWOR	SCS	44. 55	F	0.17	0. 50	53. 4	PICH	<b>0.06</b>
09/28/89	1695DWOR	SCS	44. 55	F	0.17	0. 50	53. 4	PTRC	0. 06
09/28/89	1695DWOR	SCS	42. 27	F	0.17	0. 50	53. 4	UE	0. 07
09/28/89	1695DWOR	SCS	42. 27	F	0.17	0. 50	53. 4	PEP1	0. 07
09/28/89	1695DWOR	SCS	44. 20	F	0.17	0. 50	53. 4	UE	0. 18
10/06/89	1695DWOR	SST	0.00	s	0.00	0.00	0.0	XX	0.00
10/10/89	1695DWOR	SCS	0.00	s	0.00	0.00	0.0	VH	0.00
10/10/89	1695DWOR	SST	0.00	s	0.00	0.00	0.0	BU	0.00
10/11/89	1695DWOR	SST	0.00	F	0.00	0.00	0.0	TG	10. 58
10/11/89	1695DWOR	SST	0.00	F	0.00	0.00	0.0	VH	10. 58
10/11/89	1695DWOR	SST	0.00	F	0.00	0.00	0.0	PICH	5. 46
10/11/89	1695DWOR	SST	9.00	Y	0.00	0.00	0.0	VH	5. 46
10/18/89	1695DWOR	SST	12.00	Y	0.16	0. 72	53. 4	BU	0. 96
10/18/89	1695DWOR	SCS	0.00	s	0.00	0.00	53. 4	VH	0.00
10/18/89	1695DWOR	SCS	0.00	B	0.00	0.00	53. 4	UE	0.00
10/18/89	1695DWOR	SCS	0.00	B	0.00	0.00	53. 4	BK	0.00
10/19/89	1695DWOR	SST	82.39	F	0.06	0. 18	53. 4	PICH	3. 93
10/19/89	1695DWOR	SST	92. 06	F	0.09	0.18	53. 4	PICH	10. 58
10/19/89	1695DWOR	SST	92.16	F	0.07	0.18	53. 4	PICH	0. 76
10123189	1695DWOR	SST	82.39	F	0.06	0.18	53. 4	PICH	3. 93
10124189	1695DWOR	SST	92.06	F	0.09	0.18	53. 4	VH	10. 58
10/31/89	1695DWOR	SCS	33. 40	F	0.19	0. 60	53. 3	UE	0. 35
10/31/89	1695DWOR	SCS	33. 40	F	0.19	0. 60	53. 3	PSCY	0. 35
10/31/89	1695DWOR	SCS	31. 20	F	0.22	0. 60	53. 3	UE	0. 14
10/31/89	1695DWOR	SCS	26. 40	F	0.23	0. 60	53. 3	XX	0. 87
11/02/89	1695DWOR	SST	82.39	F	0.06	0. 18	53. 4	PICH	3. 93
11102189	1695DWOR	SST	82. 35	F	0.06	0. 18	53. 4	BU	3. 93
11/03/89	1695DWOR	SST	73. 13	F	0.06	0. 18	53. 4	TG	2. 03
11/03/89	1595DWOR	SST	73. 13	F	0.06	0. 18	53. 4	PICH	2. 03
11/06/89	1695DWOR	SST	88. 23	F	0.06	0. 18	53. 4	PICH	1. 90
11/06/89	1695DWOR	SST	88. 23	F	0.06	0. 18	53. 4	TG	1. 90
11/06/89	1695DWOR	SST	88. 23	F	0.06	0. 18	53. 4	PTRC	1. 90
11/06/89	1695DWOR	SST	92.06	F	0.09	0. 18	53. 4	PICH	10. 58
11/06/89	1695DWOR	SST	92.06	F	0.09	0. 18	53. 4	PEP1	10. 58
11/06/89	1695DWOR	SST	92.06	F	0.09	0. 18	53. 4	VH	10. 58
11/06/89	1695DWOR	SST	94.19	F	0.07	0. 18	53. 4	VH	0. 24
11/06/89	1695DWOR	SST	94.19	F	0.07	0. 18	53. 4	PICH	0. 24
11/21/89	1695DWOR	SST	58. 00	F	0.06	0. 28	53. 4	PEP1	0. 00
11/21/89	1695DWOR	SST	58. 00	F	0.06	0. 28	53. 4	TG	0. 00
11/21/89	1695DWOR	SST	58. 00	F	0.06	0. 28	53. 4	PTRC	0. 00
11/27/89	1695DWOR	SCS	25. 10	F	0.26	0. 70	48. 2	UE	0. 02
11/27/89	1695DWOR	SCS	25.10	F	0.26	0. 70	48.2	PEP1	0. 02
11/27/89	1695DWOR	SCS	25.10	F	0.26	0. 70	48.2	PTRY	0. 02
11/27/89	1695DWOR	SCS	26.90	F	0.26	0. 70	48. 2	LIE	0. 02
11/27/89	1695DWOR	SCS	26.90	F	0.26	0. 70	48. 2	PEP1	0. 02
11/27/89	1695DWOR	SCS	26.90	F	0.26	0. 70	48. 2	PTRY	0. 02
11/27/89	1695DWOR	SCS	24. 20	Y	0.27	0. 70	48. 2	UE	0. 07
11/27/89	1695DWOR	SCS	24. 20	Y	0.27	0. 70	48.2	PEP1	0. 07

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11/27/89	1695DWOR	SCS	24.20	Y	0.27	0.70	48.2	PTRY	0.07
11/27/89	1695DWOR	SCS	25.40	F	0.26	0.70	48.2	PEP1	0.05
11/27/89	1695DWOR	SCS	25.40	F	0.26	0.70	48.2	PTRC	0.05
11/27/89	1695DWOR	SCS	25.40	F	0.26	0.70	48.2	UE	0.05
11/27/89	1695DWOR	SCS	25.40	F	0.26	0.70	48.2	PTRY	0.05
11/27/89	1695DWOR	SCS	25.00	Y	0.27	0.70	48.2	UE	0.14
11/27/89	1695DWOR	SCS	25.00	Y	0.27	0.70	48.2	PEP1	0.14
11/27/89	1695DWOR	SCS	25.00	Y	0.27	0.70	48.2	PTRY	0.14
11/27/89	1695DWOR	SCS	25.90	F	0.25	0.70	48.2	UE	0.05
11/27/89	1695DWOR	SCS	25.90	F	0.25	0.70	48.2	PEP1	0.05
11/27/89	1695DWOR	SCS	25.90	F	0.25	0.70	48.2	PTRY	0.05
11/27/89	1695DWOR	SCS	0.00	F	0.21	0.70	48.2	PICH	0.18
11/27/89	1695DWOR	SCS	0.00	F	0.21	0.70	48.2	PEP1	0.18
11/27/89	1695DWOR	SCS	23.60	Y	0.26	0.70	48.2	UE	0.03
11/27/89	1695DWOR	SCS	23.60	Y	0.26	0.70	48.2	PTRC	0.03
11/27/89	1695DWOR	SCS	23.60	Y	0.26	0.70	48.2	PEP1	0.03
11/27/89	1695DWOR	SCS	29.60	F	0.24	0.70	48.2	UE	6.00
11/27/89	1695DWOR	SCS	29.60	F	0.24	0.70	48.2	PEPI	6.00
12/07/89	1695DWOR	SST	40.47	F	0.07	0.30	54.1	PICH	0.40
12/07/89	1695DWOR	SST	40.47	F	0.07	0.30	54.1	PSCY	0.40
12/12/89	1695DWOR	SST	29.09	F	0.07	0.30	54.1	PEP1	3.49
12/11/189	1695DWOR	SST	29.09	F	0.07	0.30	54.1	PICH	3.49
12/12/89	1695DWOR	SST	29.09	F	0.07	0.30	54.1	TG	3.49
12/12/89	1695DWOR	SST	11.40	Y	0.20	0.98	43.6	PEP1	1.42
12/12/89	1695DWOR	SST	11.40	Y	0.20	0.98	43.6	PTRC	1.42
12/12/89	1695DWOR	SST	11.40	Y	0.20	0.98	43.6	TG	1.42
12/11/189	1695DWOR	SST	11.40	Y	0.20	0.98	43.6	PTRY	1.42
12/11/3189	1695DWOR	SST	39.07	F	0.06	0.30	54.1	PICH	1.66
12/11/3189	1695DWOR	SST	39.07	F	0.06	0.30	54.1	TG	1.66
12/13/89	1695DWOR	SST	39.07	F	0.06	0.30	54.1	PEP1	1.66
12/15/89	1695DWOR	SST	34.25	F	0.07	0.30	54.1	VH	4.65
12/15/89	1695DWOR	SST	34.25	F	0.07	0.30	54.1	PICH	4.69
12/15/89	1695DWOR	SST	34.25	F	0.07	0.30	54.1	TG	4.69
12/15/89	1695DWOR	SST	34.25	F	0.07	0.30	54.1	PTRC	4.69
12/15/89	1695DWOR	SST	34.25	F	0.07	0.30	54.1	PEP1	4.69
12/19/89	1695DWOR	RBT	3510.60	S	0.03	0.00	54.4	xx	8.09
12/19/89	1695DWOR	SST	28.61	F	0.07	0.30	54.1	xx	2.73
12/19/89	1695DWOR	RBT	3510.60	S	0.03	0.00	54.4	xx	11.09
12/19/89	1695DWOR	SST	28.61	F	0.07	0.30	54.1	PICH	2.73
01/02/90	1695DWOR	SST	11.24	Y	0.22	1.00	41.6	PSCY	0.25
01/02/90	1695DWOR	SST	11.24	Y	0.22	1.04	41.6	PTRC	0.25
01/02/90	1695DWOR	SST	11.24	Y	0.22	1.04	41.6	PTRY	0.25
01/10/3190	1695DWOR	SCS	22.57	Y	0.20	0.70	43.6	UE	0.15
01/03/90	1695DWOR	SCS	22.57	Y	0.20	0.70	43.6	PTRY	0.15
01/10/3190	1695DWOR	SCS	19.40	Y	0.26	0.70	43.6	UE	0.06
01/03/90	1695DWOR	SCS	22.50	Y	0.27	0.70	43.6	UE	0.23
01/03/90	1695DWOR	SCS	22.50	Y	0.27	0.70	43.6	BK	0.23
01/03/90	1695DWOR	SCS	22.55	Y	0.29	0.70	43.6	UE	0.04
01/03/90	1695DWOR	SCS	22.55	Y	0.29	0.70	43.6	BK	0.04
01/03/90	1695DWOR	SCS	20.35	Y	0.25	0.70	43.6	UE	0.35

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01/03/90	1695DWOR	SCS	20.35	Y	0.25	0.70	43.6	PEPI	0.35
01/03/90	1695DWOR	SCS	22.57	Y	0.20	0.70	43.6	UE	0.15
01/03/90	1695DWOR	SCS	22.57	Y	0.20	0.70	43.6	PSCY	0.15
01/03/90	1695DWOR	SCS	22.57	Y	0.20	0.70	43.6	PTRY	0.15
01/03/90	1695DWOR	SCS	22.57	Y	0.20	0.70	43.6	PTRC	0.15
01/03/90	1695DWOR	SCS	19.40	Y	0.26	0.70	43.6	UE	0.06
01/03/90	1695DWOR	SCS	19.40	Y	0.26	0.70	43.6	PEP1	0.06
01/03/90	1695DWOR	SCS	19.40	Y	0.26	0.70	43.6	PSCY	0.06
01/03/90	1695DWOR	SCS	22.55	Y	0.29	0.70	43.6	UE	0.04
01/03/90	1695DWOR	SCS	22.55	Y	0.29	0.70	43.6	PEPI	0.04
01/03/90	1695DWOR	SCS	22.55	Y	0.29	0.70	43.6	PTRC	0.04
01/03/90	1695DWOR	SCS	22.55	Y	0.29	0.70	43.6	PTRY	0.04
01/04/90	1695DWOR	SST	12.33	Y	0.20	0.00	41.7	PTRC	0.75
01/04/90	1695DWOR	SST	12.16	Y	0.20	0.00	41.7	PTRC	1.08
01/04/90	1695DWOR	SST	12.16	Y	0.20	0.00	41.7	PTRY	1.08
01/04/90	1695DWOR	SST	11.74	Y	0.20	0.00	41.7	PTRC	0.64
01/04/90	1695DWOR	SST	11.74	Y	0.20	0.00	41.7	PTRY	0.64
01/04/90	1695DWOR	RBT	625.00	F	0.10	0.00	54.0	xx	13.96
01/05/90	1695DWOR	SST	26.81	F	0.09	0.41	54.0	PICH	9.09
01/05/90	1695DWOR	SST	26.81	F	0.05	0.41	54.0	xx	9.09
01/08/90	1695DWOR	SCS	520.00	F	0.25	0.00	41.0	UF	2.80
01/16/90	1695DWOR	SST	9.04	Y	0.20	1.00	41.6	PTRC	0.67
01/16/90	1695DWOR	SST	9.42	Y	0.21	1.00	41.6	PTRC	0.90
01/18/90	1695DWOR	SST	23.91	Y	0.10	0.41	54.0	PICH	9.57
01/23/90	1695DWOR	SST	9.15	Y	0.21	1.00	41.6	BU	0.88
01/25/90	1695DWOR	SST	9.59	Y	0.22	1.00	41.6	PEPI	0.72
01/25/90	1695DWOR	SST	9.59	Y	0.22	1.00	41.6	PTRC	0.72
01/29/90	1695DWOR	RBT	625.00	F	0.10	0.00	54.0	XX	11.02
01/29/90	1695DWOR	SCS	22.00	Y	0.25	0.70	41.6	BK	0.14
01/30/90	1695DWOR	SCS	23.96	Y	0.26	0.70	41.6	BK	0.18
01/30/90	1695DWOR	SCS	22.63	Y	0.25	0.70	41.6	BK	0.81
01/30/90	1695DWOR	SCS	22.13	Y	0.27	0.70	41.6	BK	0.39
01/31/90	1695DWOR	SST	7.71	Y	0.21	1.00	41.6	PTRC	1.03
01/31/90	1695DWOR	SST	7.71	Y	0.21	1.00	41.6	PSCY	1.03
01/31/90	1695DWOR	SST	9.21	Y	0.21	1.00	41.6	PTRC	0.54
01/31/90	1695DWOR	RBT	357.00	F	0.13	0.00	54.4	PTRC	0.97
01/31/90	1695DWOR	RBT	398.00	F	0.16	0.00	54.4	PTRC	1.19
02/01/90	1695DWOR	SST	12.30	Y	0.10	0.53	53.2	PICH	0.16
02/01/90	1695DWOR	SST	12.30	Y	0.10	0.53	53.2	VH	0.16
02/01/90	1695DWOR	SST	5.03	Y	0.09	0.80	52.0	PTRC	0.15
02/01/90	1695DWOR	SST	5.03	Y	0.09	0.80	52.0	VH	0.15
02/02/90	1695DWOR	SST	7.74	Y	0.21	1.04	40.5	PTRC	1.51
02/05/90	1655DWOR	SST	7.50	Y	0.23	1.04	40.5	PTRC	0.59
02/05/90	1695DWOR	SST	7.47	Y	0.22	1.04	40.5	PTRC	0.68
02/05/90	1695DWOR	SST	7.76	Y	0.23	1.04	40.5	PTRC	0.64
02/06/90	1695DWOR	SST	7.47	Y	0.23	0.80	52.0	PTRC	0.56
02/06/90	1695DWOR	SST	7.68	Y	0.15	1.04	40.5	PTRC	0.65
02/06/90	1695DWOR	SST	18.46	Y	0.11	0.53	54.4	UE	1.40
02/09/90	1695DWOR	SST	12.30	Y	0.10	0.53	54.4	PICH	1.84
02/09/90	1695DWOR	SST	5.03	Y	0.09	0.80	52.0	PEPI	0.11

FISH AND WILDLIFE SERVICE  
FISH DISEASE SUMMARY

DATE LOCATION SPE FISH/LB AGE DEN-IND FLOW-IND TEMP DIS LOSS/MO

02/21/90	<b>1695DWOR</b>	SST	19.59	Y	0.07	0.53	54.4	PICH	0.16
02/21/90	1695DWOR	SST	19.59	Y	0.07	0.53	54.4	VH	0.16
02/21/90	1635DWOR	SST	9.39	Y	0.20	1.04	40.5	PTRC	0.11
02/21/90	1695DWOR	SST	7.25	Y	0.21	1.04	40.5	PTRC	0.06
02/21/90	1695DWOR	SST	7.25	Y	0.21	1.04	40.5	UE	0.06
02/22/90	1695DWOR	SST	15.28	Y	0.10	0.53	54.4	XX	1.64
02/28/90	1695DWOR	SCS	21.45	Y	0.30	28.50	40.5	BK	0.00
02/28/90	1695DWOR	SCS	20.55	Y	0.29	28.50	40.5	BK	1.34
02/28/90	1695DWOR	SCS	20.65	Y	0.28	28.50	40.5	BK	0.00
02/28/90	<b>1695DWOR</b>	SCS	19.00	Y	0.32	28.50	40.5	BK	0.00
02/28/90	1695DWOR	SCS	19.80	Y	0.27	28.50	40.5	BK	0.00
02/28/90	1695DWOR	SCS	19.80	Y	0.29	28.50	40.5	BK	2.58
02/28/90	1695DWOR	SCS	18.50	Y	0.25	28.50	40.5	BK	1.43
03/01/90	1695DWOR	SCS	18.50	Y	0.32	28.50	40.5	BK	0.25
03/07/90	1695DWOR	SST	0.00	Y	0.00	0.00	54.0	BK	0.31
03/07/90	<b>1695DWOR</b>	SST	0.00	Y	0.00	0.00	54.0	TS	0.31
03/07/90	1695DWOR	SST	0.00	Y	0.00	0.00	54.0	PTRC	0.31
04/26/90	1695DWOR	SST	2086.00	E	0.15	0.00	52.5	XX	2.58
04/26/90	1695DWOR	SCS	108.00	F	0.73	0.00	41.8	XX	1.43
04/26/90	1695DWOR	SST	6.01	Y	0.25	0.46	41.8	PEP1	0.25
04/26/90	<b>1695DWOR</b>	SST	6.01	Y	0.25	0.46	41.8	PTRC	0.25
04/26/90	<b>1695DWOR</b>	SST	8.52	Y	0.16	0.30	52.0	PTRC	0.76
04/26/90	1695DWOR	SST	8.52	Y	0.16	0.30	52.0	PEP1	0.76
04/26/90	1695DWOR	SST	6.79	Y	0.28	0.48	47.1	PTRC	0.09
04/26/90	<b>1695DWOR</b>	SST	6.79	Y	0.28	0.48	47.1	PEP1	0.89
04/30/90	1695DWOR	SCS	381.93	F	0.65	0.00	41.8	LIE	3.48
05/11/90	1695DWOR	SCS	114.90	F	0.21	12.80	47.1	VN	4.23
05/11/90	1635DWOR	SCS	114.90	F	0.21	12.80	47.1	UE	4.23
05/11/90	1695DWOR	SCS	111.43	F	0.32	12.80	47.1	VN	4.04

EAGLE CREEK NATIONAL FISH HATCHERY

DATE      LOCATION SPE FISH/LB AGE DEN-IND FLOW-IND TEMP DIS LOSS/MO

01/12/89	4398EGCK	WST	16.00	Y	0.25	0.60	41.0	PSCY	0.30
01/12/89	4398EGCK	WST	16.00	Y	0.25	0.60	41.0	PEP1	0.30
01/12/89	4398EGCK	WST	16.00	Y	0.25	0.60	41.0	TG	0.30
01/12/89	4398EGCK	COS	24.00	Y	0.37	0.89	41.0	PEP1	0.10
01/12/89	4398EGCK	COS	24.00	Y	0.37	0.89	41.0	PSCY	0.10
01/12/89	4398EGCK	COS	28.00	F	0.12	0.30	40.0	BW	0.40
01/31/89	4398EGCK	WST	0.00	B	0.00	0.00	0.0	SC	0.00
02/16/89	4398EGCK	WST	13.00	Y	0.31	0.74	37.0	PEP1	0.10
02/16/89	4398EGCK	WST	13.00	Y	0.31	0.74	37.0	<b>PSCY</b>	0.10
02/16/89	4398EGCK	WST	13.00	Y	0.31	0.74	37.0	TG	0.10
02/16/89	4398EGCK	COS	19.20	Y	0.46	1.11	37.0	PEP1	0.03
02/16/89	4398EGCK	COS	19.20	Y	0.46	1.11	37.0	<b>PSCY</b>	0.03
02/16/89	4398EGCK	COS	28.00	F	0.12	0.30	37.0	PEP1	0.05
02/16/89	4398EGCK	COS	28.00	F	0.12	0.30	37.0	<b>PSCY</b>	0.05
02/16/89	4398EGCK	COS	23.00	Y	0.36	0.87	37.0	PEP1	0.05
02/16/89	4398EGCK	COS	23.00	Y	0.36	0.87	37.0	PSCY	0.45
02/16/89	4398EGCK	COS	1100.00	F	0.70	2.16	38.0	XX	0.00
03/07/89	4398EGCK	COS	19.50	Y	0.41	1.01	39.0	PEP1	0.00
03/13/89	4398EGCK	WST	12.50	Y	0.31	0.75	40.0	PEP1	0.00
03/13/89	4398EGCK	WST	12.50	Y	0.31	0.75	40.0	<b>PSCY</b>	0.00
03/13/89	4398EGCK	WST	12.50	Y	0.31	0.75	40.0	TG	0.00
03/13/89	4398EGCK	COS	18.00	Y	0.47	1.16	40.0	PEP1	0.00
03/13/89	4398EGCK	COS	18.00	Y	0.47	1.16	40.0	PSCY	0.00
03/13/89	4398EGCK	COS	21.00	Y	0.40	0.97	40.0	<b>PSCY</b>	0.00
03/13/89	4398EGCK	COS	21.00	Y	0.40	0.97	40.0	PEP1	0.00
03/13/89	4398EGCK	COS	21.00	Y	0.40	0.97	40.0	TG	0.00
03/13/89	4398EGCK	COS	20.20	Y	0.39	0.94	39.0	xx	0.00
03/24/89	4398EGCK	COS	25.00	Y	0.13	0.33	40.0	PEP1	0.00
03/24/89	4398EGCK	COS	25.00	Y	0.13	0.33	40.0	<b>PSCY</b>	0.00
03/24/89	4398EGCK	COS	700.00	F	0.21	1.05	40.0	xx	0.00
04/10/89	4398EGCK	COS	450.00	F	0.21	1.04	41.0	xx	0.00
04/10/89	4398EGCK	COS	25.00	Y	0.13	0.33	39.0	<b>PSCY</b>	0.00
04/10/89	4398EGCK	COS	25.00	Y	0.13	0.33	39.0	PEP1	0.00
04/10/89	4398EGCK	WST	11.10	Y	0.33	0.81	41.0	PSCY	0.00
04/10/89	4398EGCK	WST	11.10	Y	0.33	0.81	41.0	PEP1	0.00
04/10/89	4398EGCK	WST	11.10	Y	0.33	0.81	41.0	TG	0.00
04/27/89	4398EGCK	COS	340.00	F	0.26	1.29	42.0	BW	0.00
05/10/89	4398EGCK	COS	260.00	F	0.30	0.74	44.0	BW	0.00
05/10/89	4398EGCK	COS	460.00	F	0.24	0.59	44.0	<b>XX</b>	0.00
05/10/89	4398EGCK	WST	800.00	F	0.73	1.58	42.0	UW	0.00
05/10/89	4398EGCK	COS	15.00	Y	0.42	1.03	44.0	PEP1	0.00
06/02/89	4398EGCK	COS	156.00	F	0.38	0.95	46.0	PAMB	0.00
06/02/89	4398EGCK	COS	156.00	F	0.38	0.95	46.0	BW	0.00
06/08/89	4398EGCK	WST	530.00	F	0.43	0.89	48.0	<b>XX</b>	7.20
06/08/89	4398EGCK	COS	200.00	F	0.40	1.00	48.0	BW	8.00
06/08/89	4398EGCK	COS	200.00	F	0.40	1.00	48.0	PAMB	8.00
07/10/89	4398EGCK	WST	110.00	F	0.14	0.36	55.0	XX	1.00
07/10/89	4398EGCK	COS	90.00	F	0.26	0.65	55.0	<b>PAMB</b>	0.10
07/10/89	<b>4398EGCK</b>	COS	115.00	F	0.22	0.55	55.0	xx	0.30
08/16/89	4398EGCK	COS	82.00	F	3.04	7.39	59.0	<b>XX</b>	0.76

FISH AND WILDLIFE SERVICE  
FISH DISEASE SUMMARY

DATE LOCATION SPE FISH/LB AGE DEN-IND FLOW-IND TEMP DIS LOSS/MO

08/16/89	4398EGCK	WST	82.00	F	0.20	0.49	59.0	PEP1	0.40
08/16/89	4398EGCK	COS	48.00	F	0.40	0.98	59.0	XX	0.08
08/16/89	4398EGCK	COS	48.00	F	0.43	1.07	59.0	xx	0.10
09/12/89	4398EGCK	COS	45.00	F	0.45	1.11	57.0	xx	0.40
09/12/89	4398EGCK	WST	47.00	F	0.27	0.68	0.0	PEP1	0.20
09/12/89	4398EGCK	COS	32.00	F	0.51	1.28	57.0	BW	0.20
10/12/89	4398EGCK	WST	25.50	F	0.40	0.99	51.0	PSCY	0.20
11/16/89	4398EGCK	COS	20.00	Y	0.63	1.58	45.0	BW	0.20
11/16/89	4398EGCK	WST	11.80	Y	0.25	0.61	45.0	PEPI	0.03
11/16/89	4398EGCK	WST	11.80	Y	0.25	0.61	45.0	PSCY	0.03
01/09/90	4398EGCK	WST	10.00	Y	0.30	0.75	44.0	BW	0.00
01/09/90	4398EGCK	WST	10.00	Y	0.30	0.75	44.0	PEP1	0.00
01/09/90	4398EGCK	WST	10.00	Y	0.30	0.75	44.0	PSCY	0.00
01/09/90	4398EGCK	COS	19.20	Y	0.47	1.16	44.0	BW	0.12
02/06/90	4398EGCK	WST	9.10	Y	0.40	1.00	40.0	TD	0.30
02/06/90	4398EGCK	WST	9.10	Y	0.40	1.00	40.0	PEP1	0.30
02/06/90	4398EGCK	WST	9.10	Y	0.40	1.00	40.0	PSCY	0.30
02/06/90	4398EGCK	WST	9.10	Y	0.40	1.00	40.0	BW	0.30
02/06/90	4398EGCK	WST	0.08	B	0.00	0.00	44.0	BK	0.00
02/06/90	4398EGCK	WST	0.08	B	0.00	0.00	44.0	SC	0.00
02/07/90	4398EGCK	COS	16.60	Y	0.50	1.23	40.0	PEP1	0.20
02/21/90	4398EGCK	WST	9.00	Y	0.40	1.01	42.0	BW	0.20
04/06/90	4398EGCK	COS	15.00	Y	0.54	1.35	42.0	PEP1	0.05
04/06/90	4398EGCK	COS	15.00	Y	0.54	1.35	42.0	PSCY	0.09
04/06/90	4398EGCK	COS	13.60	Y	0.58	1.43	42.0	PEP1	0.10
04/06/90	4398EGCK	COS	13.60	Y	0.58	1.43	42.0	PSCY	0.10
04/06/90	4398EGCK	WST	7.00	Y	0.28	0.51	42.0	PEP1	0.06
04/06/90	4398EGCK	WST	7.00	Y	0.28	0.51	42.0	PSCY	0.06
04/06/90	4398EGCK	WST	7.00	Y	0.28	0.51	42.0	TG	0.06
05/04/90	4398EGCK	WST	1450.00	S	0.24	0.46	45.0	UW	1.70

## ENTIAT NATIONAL FISH HATCHERY

DATE LOCATION SPE FISH/LB AGE DEN-IND FLOW-IND TEMP DIS LOSS/MO

01/11/89	5399ENT	scs	26.70	F	0.21	0.78	37.0	XX	0.00
01/11/89	5399ENT	scs	28.30	F	0.20	0.75	37.0	xx	0.10
02/15/89	5399ENT	scs	26.70	F	0.20	0.85	37.0	PCOS	0.20
02/15/89	5399ENT	scs	26.70	F	0.20	0.85	37.0	BK	0.20
02/15/89	5399ENT	scs	290.00	F	0.20	0.90	48.0	XX	0.25
03/09/89	5399ENT	scs	289.00	F	0.20	1.80	48.0	XX	0.17
03/09/89	5399ENT	scs	239.00	F	0.19	1.16	48.0	XX	0.20
03/09/89	5399ENT	scs	27.40	F	0.20	0.85	38.0	PCOS	0.30
03/29/89	5399ENT	scs	24.10	Y	0.22	0.82	42.0	PCOS	0.53
03/29/89	5399ENT	scs	24.10	Y	0.22	0.82	42.0	VN	0.53
05/08/89	5399ENT	scs	100.00	F	0.09	0.36	46.0	XX	30.00
06/05/89	5399ENT	SCS	0.00	F	0.00	0.00	0.0	XX	0.00
06/05/89	5399ENT	scs	0.00	F	0.00	0.00	0.0	XX	0.00
07/11/89	5399ENT	scs	46.50	F	0.17	0.88	50.0	BK	0.09
07/11/89	5399ENT	scs	40.00	F	0.18	0.93	50.0	xx	0.03
08/01/89	5399ENT	scs	0.00		0.00	0.90	0.0	BK	0.00
08/01/89	5399ENT	scs	0.00		0.00	0.00	0.0	su	0.00
09/12/89	5399ENT	scs	33.20	F	0.22	0.95	56.7	BK	0.05
09/12/89	5399ENT	scs	33.20	F	0.22	0.95	56.7	PCOS	0.05
09/12/89	5399ENT	scs	33.20	F	0.22	0.95	56.7	SU	0.05
10/11/89	5399ENT	scs	28.90	F	0.25	0.83	54.5	XX	0.08
11/16/89	5399ENT	scs	22.60	Y	0.29	0.99	47.7	xx	0.07
11/16/89	5399ENT	scs	23.60	Y	0.08	14.76	47.5	VN	0.32
11/16/89	5399ENT	scs	23.60	Y	0.08	14.76	47.5	BK	0.32
12/12/89	5399ENT	scs	22.70	Y	0.13	0.43	40.6	VN	0.11
12/12/89	5399ENT	scs	0.00		0.00	0.00	0.0	UW	0.00
12/12/89	5399ENT	scs	23.00	Y	0.08	0.88	40.6	VN	0.00
12/12/89	5399ENT	scs	23.00	Y	0.08	0.88	40.6	PEP1	0.00
01/12/90	5399ENT	scs	894.00	F	0.09	0.70	48.7	XX	1.64
01/12/90	5399ENT	scs	705.00	F	0.28	1.46	48.7	XX	1.67
01/12/90	5399ENT	scs	24.70	Y	0.08	0.83	36.0	XX	0.00
01/12/90	5399ENT	scs	22.60	Y	0.19	0.63	36.0	XX	0.20
02/21/90	5399ENT	scs	23.70	Y	0.18	0.62	35.5	PEPI	0.07
02/21/90	5399ENT	scs	404.00	F	0.23	1.41	48.7	XX	4.34
02/21/90	5399ENT	scs	23.00	Y	0.14	1.48	35.5	BK	1.88
02/21/90	5399ENT	scs	23.00	Y	0.14	1.48	35.5	VN	1.88
02/21/90	5399ENT	scs	23.00	Y	0.14	1.48	35.5	BM	1.88
02/21/90	5399ENT	KOE	0.00		0.00	0.00	0.0	xx	0.00
03/15/90	5399ENT	scs	23.00	Y	0.20	0.68	36.0	XX	0.27
03/15/90	5399ENT	scs	23.00	Y	0.05	1.36	36.0	XX	0.82
03/15/90	5399ENT	KOE	4339.00	S	1.06	1.26	46.0	DM	0.72
03/15/90	5399ENT	SCS	240.00	F	0.20	1.20	46.0	XX	0.74
03/30/90	5399ENT	scs	21.30	Y	0.13	1.38	41.6	VN	2.00
03/30/90	5399ENT	scs	21.30	Y	0.13	1.33	41.6	BK	2.00
04/16/90	5399ENT	KOE	2000.00	S	0.19	0.96	45.3	XX	2.00
04/16/90	5399ENT	scs	21.30	Y	0.13	1.38	41.6	BK	2.00
04/16/90	5399ENT	scs	20.90	Y	0.16	0.53	41.6	XX	0.21
04/16/90	5399ENT	SCS	150.00	F	0.32	1.07	43.8	XX	0.16
05/07/90	5399ENT	KOE	0.00		0.00	0.00	0.0	XX	0.00
05/07/90	5399ENT	scs	0.00	F	0.00	0.00	0.0	xx	0.00

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FISH AND WILDLIFE SERVICE  
FISH DISEASE SUMMARY

DATE LOCATION SPE FISH/LB AGE DEN-IND FLOW-IND TEMP DIS LOSS/MO

05/07/90 5399ENT SCS 0.00 F 0.00 0.00 0.0 xx 0.00

HAGERMAN NATIONAL FISH HATCHERY

DATE LOCATION SPE FISH/LB AGE DEN-IND FLOW-IND TEMP DIS LOSS/MO

03/09/89	1695HGMN	SST	5.81	Y	0.00	0.00	59.0	UE	0.00
03/09/89	1695HGMN	SST	6.09	Y	0.00	0.00	59.0	UE	0.00
04/27/89	<b>1695HGMN</b>	RBT	16.64	Y	0.24	0.54	57.0	PEP1	0.00
05/11/89	1695HGMN	RBT	16.64	Y	0.24	0.54	59.0	VH	1.00
05/11/89	1695HGMN	RBT	16.64	Y	0.24	0.54	59.0	BR	1.00
05/11/89	<b>1695HGMN</b>	RBT	16.64	Y	0.24	0.54	59.0	BK	1.00
08/09/89	1695HGMN	SST	291.72	F	0.00	0.00	58.0	PEP1	0.00
08/10/89	1695HGMN	SCS	44.00	F	0.16	1.10	53.0	BK	0.00
08/10/89	1695HGMN	SCS	44.00	F	0.16	1.10	53.0	PICH	0.00
10/16/89	1695HGMN	SST	18.38	Y	0.00	0.00	59.0	TG	0.00
10/16/89	1695HGMN	SST	21.27	Y	0.00	0.00	59.0	TG	0.00
10/16/89	1695HGMN	SST	22.55	Y	0.00	0.00	59.0	xx	0.00
11/16/89	1695HGMN	SST	8.99	Y	0.00	0.00	0.0	VH	0.00
11/16/89	1695HGMN	SST	8.99	Y	0.00	0.00	59.0	xx	0.00
11/16/89	1695HGMN	SST	11.66	Y	0.00	0.00	0.0	VH	0.00
11/16/89	<b>1695HGMN</b>	SST	11.36	Y	0.00	0.00	59.0	VH	0.00
11/16/89	1695HGMN	SST	10.93	Y	0.00	0.00	0.0	VH	0.00
11/16/89	1695HGMN	SST	11.36	Y	0.00	0.00	0.0	VH	0.00
12/01/89	1695HGMN	SST	7.20	Y	0.00	0.00	0.0	TG	0.00
12/01/89	1695HGMN	SST	7.20	Y	0.00	0.00	59.0	BR	0.00
12/19/89	1695HGMN	SST	10.85	Y	0.00	0.00	0.0	TG	0.00
12/19/89	1695HGMN	SST	10.85	Y	0.00	0.00	59.0	PICH	0.00
01/17/90	1695HGMN	SST	10.20	Y	0.00	0.00	59.0	VH	0.00
01/17/90	<b>1695HGMN</b>	SST	7.06	Y	0.00	0.00	59.0	VH	0.00
02/15/90	1695HGMN	SST	6.42	F	0.00	0.00	59.0	XX	0.00
02/15/90	1695HGMN	SST	6.26	Y	0.00	0.00	59.0	XX	0.00
02/15/90	1695HGMN	SST	6.38	Y	0.00	0.00	59.0	xx	0.00
02/15/90	1695HGMN	SST	4.90	Y	0.00	0.00	59.0	UE	0.00
03/06/90	1695HGMN	SST	4.69	Y	0.00	0.00	59.0	UE	4.23
03/07/90	1695HGMN	SST	5.51	Y	0.00	0.00	59.0	UE	4.04
03/07/90	1695HGMN	SST	5.79	Y	0.00	0.00	59.0	xx	4.32
03/07/90	1695HGMN	SST	5.67	Y	0.00	0.00	59.0	xx	5.14
03/08/90	1695HGMN	RBT	103.00	F	0.00	0.00	59.0	UE	0.19
03/08/90	1695HGMN	RBT	214.00	F	0.00	0.00	59.0	BK	0.24
03/08/90	1695HGMN	<b>RBT</b>	214.00	F	0.00	0.00	59.0	UE	0.24
03/08/90	1695HGMN	RBT	214.00	F	0.00	0.00	59.0	TS	0.24
04/29/90	1695HGMN	RBT	20.78	Y	0.16	0.43	59.0	xx	0.00
04/29/90	1695HGMN	RBT	24.34	Y	0.16	0.43	59.0	xx	0.00

KOOSKIA NATIONAL FISH HATCHERY

DATE      LOCATION **SPE** FISH/LB AGE DEN-IND FLOW-IND TEMP DIS LOSS/MO

03/10/89	1695KOOS	SCS	0.00	F	0.00	0.00	0.0	<b>UE</b>	0.00
03/10/89	1695KOOS	SCS	0.00	F	0.00	0.00	0.0	<b>UE</b>	0.00
03/15/89	1695KOOS	SCS	11.44	Y	0.19	0.84	0.0	<b>UE</b>	0.00
03/15/89	1695KOOS	SCS	11.44	Y	0.19	0.84	0.0	PTRC	0.00
03/15/89	1695KOOS	SCS	11.44	Y	0.19	0.84	0.0	PEP1	0.00
03/15/89	1695KOOS	SCS	11.44	Y	0.19	0.84	0.0	<b>UE</b>	0.00
03/15/89	1695KOOS	SCS	11.44	Y	0.19	0.84	0.0	BK	0.00
03/15/89	1695KOOS	SCS	11.44	Y	0.19	0.84	0.0	BK	0.00
04/03/89	1695KOOS	SST	0.00	F	0.00	0.00	56.0	BG	0.00
04/03/89	1695KOOS	SST	0.00	F	0.00	0.00	56.0	BG	0.00
04/03/89	1695KOOS	SST	0.00	F	0.00	0.00	56.0	BG	0.00
04/05/89	1695KOOS	SCS	0.00	F	0.17	0.63	0.0	<b>UE</b>	0.00
04/27/89	1695KOOS	SST	0.00	<b>F</b>	0.00	0.00	56.0	<b>BG</b>	0.00
04/27/89	1695KOOS	SST	0.00	F	0.00	0.00	56.0	<b>VH</b>	0.00
04/27/89	1695KOOS	SST	0.00	F	0.00	0.00	0.0	BG	0.00
04/27/89	1695KOOS	SST	0.00	F	0.00	0.00	0.0	<b>VH</b>	0.00
04/28/89	1695KOOS	SST	0.00	F	0.00	0.00	0.0	BG	0.00
05/02/89	1695KOOS	SST	0.00		0.00	0.00	0.0	<b>VH</b>	70.00
05/09/89	1695KOOS	SST	12.00	Y	0.00	0.00	46.0	<b>VH</b>	0.00
05/09/89	1695KOOS	SST	12.00	Y	0.00	0.00	46.0	SC	0.00
05/09/89	1695KOOS	SST	12.00	Y	0.00	0.00	46.0	BK	0.00
05/09/89	1695KOOS	SST	12.00	Y	0.00	0.00	46.0	<b>VN</b>	0.00
05/09/89	1695KOOS	SCS	59.00	F	0.17	0.63	48.0	XX	0.00
05/24/89	1695KOOS	SCS	90.00	F	0.00	0.00	60.0	<b>UE</b>	0.00
05/30/89	1695KOOS	SST	0.00	E	0.00	0.00	0.0	<b>VH</b>	0.00
06/05/89	1695KOOS	SCS	14.09	Y	0.13	0.89	63.0	<b>UE</b>	0.00
06/05/89	1695KOOS	SCS	14.09	Y	0.13	0.89	63.0	BK	0.00
06/20/89	1695KOOS	SCS	60.00	F	0.00	0.00	54.3	<b>UE</b>	0.00
06/20/89	1695KOOS	SCS	60.00	F	0.00	0.00	54.3	BR	0.00
06/20/89	1695KOOS	SCS	60.00	F	0.00	0.00	54.3	PEP1	0.00
06/23/89	1695KOOS	SCS	60.00	F	0.00	0.00	52.0	<b>UE</b>	0.00
06/23/89	1695KOOS	SCS	60.00	F	0.00	0.00	52.0	PEP1	0.00
06/26/89	1695KOOS	SCS	60.00	F	0.00	0.00	52.0	<b>UE</b>	0.00
06/26/89	1695KOOS	SCS	60.00	F	0.00	0.00	52.0	PICH	0.00
06/30/89	<b>1695KOOS</b>	SCS	14.09	Y	0.12	0.89	53.0	PICH	0.00
06/30/89	1695KOOS	SCS	14.09	Y	0.12	0.89	53.0	PEP1	0.00
06/30/89	<b>1695KOOS</b>	SCS	14.09	Y	0.12	0.89	53.0	<b>UE</b>	0.00
07/07/89	1695KOOS	SCS	46.50	F	0.16	1.10	.0.0	PICH	0.00
07/17/89	1695KOOS	SCS	46.50	F	0.16	1.10	52.0	PICH	0.00
07/19/89	1695KOOS	SCS	46.50	F	0.16	1.10	52.0	BK	0.00
07/19/89	1695KOOS	SCS	46.50	F	0.16	1.10	52.0	PICH	0.00
07/31/89	1695KOOS	SCS	44.00	F	0.16	1.10	52.0	PICH	0.00
08/10/89	1695KOOS	SCS	44.00	F	0.00	0.00	0.0	<b>UE</b>	0.00
08/16/89	1695KOOS	SCS	38.98	F	0.19	1.19	52.0	PICH	0.00
08/23/89	1695KOOS	SCS	39.00	F	0.19	1.19	52.0	PICH	0.00
08/23/89	1695KOOS	SCS	39.00	F	0.19	1.19	52.0	<b>UE</b>	0.00
09/07/89	<b>1695KOOS</b>	SCS	39.00	F	0.19	1.19	53.0	PICH	0.00
09/07/89	1695KOOS	scs	39.00	F	0.19	1.19	53.0	BK	0.00
09/15/89	1695KOOS	SCS	0.00	Y	0.17	0.72	53.0	<b>UE</b>	0.00
09/15/89	1695KOOS	scs	0.00	Y	0.17	0.72	53.0	BK	0.00

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FISH AND WILDLIFE SERVICE  
FISH DISEASE SUMMARY

DATE LOCATION SPE FISH/LB AGE DEN-IND FLOW-IND TEMP DIS LOSS/MO

09/15/89	1695KOOS	SCS	0.00	Y	0.17	0.72	53.0	BG	0.00
09/18/89	1695KOOS	SCS	0.00	Y	0.17	0.72	53.0	PICH	0.00
09/18/89	1695KOOS	SCS	0.00	Y	0.17	0.72	53.0	UE	0.00
09/18/89	1695KOOS	SCS	0.00	Y	0.17	0.72	53.0	PICH	0.00
09/25/89	<b>1695KOOS</b>	SCS	0.00	Y	0.17	0.72	53.0	BK	0.00
09/27/89	1695KOOS	<b>SCS</b>	0.00	Y	0.17	0.72	53.0	PICH	0.00
11/08/89	1695KOOS	SCS	0.00	Y	0.19	0.81	0.0	UE	0.00
11/08/89	1695KOOS	SCS	0.00	T	0.19	0.81	0.0	BK	0.00
12/20/89	1695KOOS	SCS	0.00	Y	0.19	0.90	38.0	BK	0.00
12/20/89	1695KOOS	SCS	0.00	Y	0.19	0.90	38.0	BK	0.00
12/20/89	1695KOOS	SCS	0.00	Y	0.19	0.90	38.0	BK	0.00
01/16/90	1695KOOS	SCS	0.00	Y	0.20	0.75	0.0	UE	0.00
01/16/90	1695KOOS	SCS	0.00	Y	0.20	0.75	0.0	UE	0.00
03/01/90	1695KOOS	SCS	25.20	F	0.29	1.12	0.0	PICH	0.76
03/01/90	1695KOOS	SCS	24.10	Y	0.29	1.12	0.0	PICH	0.09
03/01/90	1695KOOS	SCS	27.20	F	0.29	1.12	0.0	xx	0 .00
03/01/90	1695KOOS	SCS	23.10	Y	0.29	1.12	0.0	xx	0.00
03/15/90	1695KOOS	SCS	0.00	F	0.29	1.12	0.0	UE	3.48
03/15/90	1695KOOS	SCS	0.00	Y	0.29	1.12	0.0	PCOS	0.00
03/15/90	1695KOOS	SCS	0.00	Y	0.29	1.12	0.0	UE	0.00
04/09/90	1695KOOS	SCS	0.00	Y	0.19	0.84	0.0	TS	0.00
04/09/90	1695KOOS	SCS	9.00	Y	0.19	0.84	0.0	BK	0.00
05/09/90	1655KOOS	SST	1500.00	S	0.00	0.00	0.0	BU	90 .00

## LEAVENWORTH NATIONAL FISH HATCHERY

DATE LOCATION SPE FISH/LB AGE DEN-IND FLOW-IND TEMP DIS LOSS/MO

01/12/89	5399LVNW	SCS	24.90	Y	0.19	0.79	34.0	XX	0.00
01/12/89	5399LVNW	SST	138.00	F	0.28	0.83	47.1	XX	0.00
01/12/89	5399LVNW	SCS	890.00	F	0.30	0.88	47.0	xx	0.00
01/12/89	<b>5399LVNW</b>	SCS	28.00	F	0.12	2.28	34.0	<b>XX</b>	0.00
01/12/89	5399LVNW	SCS	28.00	F	0.09	1.65	34.0	XX	0.00
02/16/89	5399LVNW	SCS	25.00	Y	0.13	2.38	34.0	XX	0.00
02/16/89	5399LVNW	SCS	28.00	F	0.09	1.55	40.0	<b>XX</b>	0.00
02/16/89	5399LVNW	SST	83.40	<b>F</b>	0.42	1.24	45.0	XX	0.00
02/16/89	5399LVNW	SCS	471.00	F	0.49	1.46	45.0	XX	0.00
03/09/89	5399LVNW	SST	60.40	<b>F</b>	0.31	0.78	46.0	TG	0.07
03/09/89	5399LVNW	SCS	300.00	<b>F</b>	0.14	0.58	45.0	XX	0.10
03/09/89	<b>5399LVNW</b>	SCS	28.00	F	0.11	2.94	36.0	XX	0.10
03/09/89	5399LVNW	SCS	26.70	F	0.08	1.00	37.0	<b>XX</b>	0.02
03/30/89	5399LVNW	SST	47.40	F	0.34	0.86	43.3	TG	0.41
04/25/89	5399LVNW	SCS	174.00	F	2.64	6.71	0.0	XX	0.06
04/25/89	5399LVNW	SST	47.40	F	0.35	0.88	43.3	<b>PCOS</b>	0.40
04/25/89	5399LVNW	SST	47.40	F	0.35	<b>0.88</b>	43.3	<b>TG</b>	0.40
05/08/89	5399LVNW	SST	88.00	F	0.18	0.31	45.0	<b>XX</b>	1.40
05/08/89	5399LVNW	SST	0.00	F	0.00	0.00	42.0	<b>TG</b>	0.54
05/08/89	5399LVNW	SCS	114.00	F	0.22	1.36	45.0	XX	0.04
06/05/89	<b>5399LVNW</b>	RBT	0.00	F	0.00	0.00	0.0	<b>XX</b>	0.00
06/06/89	5399LVNW	SST	0.00	F	0.00	0.00	0.0	TG	0.00
06/06/89	5399LVNW	SCS	0.00	F	0.00	0.00	0.0	xx	0.00
06/06/89	<b>5399LVNW</b>	SCS	0.00	F	0.00	0.00	0.0	xx	0.00
06/29/89	5399LVNW	SCS	46.30	F	0.12	0.54	49.3	xx	0.12
06/29/89	5399LVNW	SCS	43.40	F	0.07	1.30	49.3	xx	0.07
06/29/89	5399LVNW	SST	31.10	F	0.05	1.01	49.3	<b>TG</b>	0.11
07/12/89	5399LVNW	SST	1200.00	F	0.38	0.67	54.0	BA	0.00
07/12/89	5399LVNW	SST	36.20	F	0.06	1.00	54.0	xx	0.00
07/31/89	5399LVNW	SST	0.00	<b>S</b>	0.00	0.00	0.0	BM	0.00
08/14/89	5399LVNW	SCS	29.00	F	0.09	1.98	56.4	BR	0.00
08/14/89	5399LVNW	SCS	29.00	F	0.09	1.98	56.4	PICH	0.00
08/14/89	5399LVNW	SST	1500.00	<b>F</b>	0.00	0.57	52.5	<b>XX</b>	0.00
09/11/89	5399LVNW	SST	464.00	F	2.96	26.38	50.0	SU	5.00
09/11/89	5399LVNW	SCS	25.40	F	0.18	0.79	54.4	<b>XX</b>	0.18
10/04/89	5399LVNW	SST	348.60	F	0.24	0.87	49.0	<b>PCOS</b>	2.50
11/16/89	5399LVNW	SST	240.70	F	3.29	8.36	47.4	BW	1.64
11/16/89	5399LVNW	SCS	24.20	Y	0.10	1.90	40.0	xx	0.00
11/16/89	5399LVNW	SCS	23.20	Y	0.34	1.14	<b>40.0</b>	<b>XX</b>	0.00
12/01/89	5399LVNW	SST	211.00	F	0.35	0.90	46.6	BM	0.76
12/13/89	5399LVNW	SCS	22.00	Y	0.05	1.81	39.2	XX	0.05
12/13/89	5399LVNW	SCS	23.00	Y	0.10	2.00	39.2	xx	0.07
12/13/89	5399LVNW	SCS	22.60	Y	0.19	0.94	39.2	xx	0.04
12/13/89	5399LVNW	SST	210.70	F	0.35	0.90	46.6	BW	0.76
01/17/90	5399LVNW	SST	154.00	F	0.33	8.40	48.0	BW	1.84
01/17/90	5399LVNW	SCS	1200.00	F	0.00	0.73	48.0	<b>UW</b>	0.76
01/17/90	<b>5399LVNW</b>	SCS	22.30	Y	0.05	1.94	36.2	XX	0.01
01/17/90	<b>5399LVNW</b>	SCS	18.60	Y	0.26	1.24	36.0	XX	0.01
01/17/90	5399LVNW	SCS	18.60	Y	0.13	2.74	36.2	XX	0.01
02/22/90	5399LVNW	SCS	305.00	F	0.93	1.45	48.0	XX	0.73

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FISH AND WILDLIFE SERVICE  
FISH DISEASE SUMMARY

DATE LOCATION SPE FISH/LB AGE DEN-IND FLOW-IND TEMP DIS LOSS/MO

02/22/90	5399LVNW	SCS	22.00	Y	0.38	1.92	36.0	DC	0.04
02/22/90	5399LVNW	SCS	22.60	Y	0.10	1.99	35.6	XX	0.04
02/22/90	5399LVNW	SST	109.00	F	0.28	0.73	48.0	BW	1.03
02/22/90	5399LVNW	KOE	914.56	F	0.00	0.00	48.0	FP	0.00
03/13/90	5399LVNW	KOE	3715.00	S	0.60	0.24	45.0	XX	0.00
03/13/90	5399LVNW	SCS	22.60	Y	0.10	1.94	39.0	PCOS	0.00
03/13/90	5399LVNW	SCS	22.60	Y	0.10	1.94	39.0	PICH	0.00
03/16/90	5399LVNW	SCS	22.64	Y	0.10	1.93	35.0	BG	0.45
03/16/90	5399LVNW	SCS	22.64	Y	0.10	1.93	35.0	PCOS	0.45
03/16/90	5399LVNW	KOE	3726.00	S	0.54	0.22	45.0	DM	4.00
03/16/90	5399LVNW	WST	82.60	F	0.30	0.89	45.0	BU	0.00
03/16/90	5399LVNW	WST	82.60	F	0.30	0.89	45.0	BW	0.00
03/21/90	5399LVNW	SCS	22.64	Y	0.10	1.93	35.0	BG	0.00
03/30/90	5399LVNW	SCS	21.00	Y	0.10	2.02	39.2	PCOS	1.24
03/30/90	5399LVNW	SCS	21.00	Y	0.10	2.02	39.2	BG	1.24
04/17/90	5399LVNW	SCS	20.00	Y	0.20	1.00	0.0	xx	0.04
04117190	5399LVNW	SCS	21.00	Y	0.10	2.00	39.2	xx	2.06
04/17/90	5399LVNW	SST	75.30	F	0.17	0.59	44.5	TG	1.85
04/17/90	5399LVNW	SST	75.30	F	0.17	0.59	44.5	PCOS	1.65
04/17/90	5399LVNW	KOE	1089.00	S	0.57	0.57	49.1	xx	2.66
04117190	5399LVNW	SCS	19.80	Y	0.05	1.93	39.2	XX	0.27
05/07/90	5399LVNW	KOE	860.00	F	0.83	0.83	47.0	xx	0.00
05/07/90	5399LVNW	SCS	122.30	F	0.23	1.13	44.5	xx	0.00
05/07/90	5399LVNW	SCS	26.70	F	0.03	0.60	45.0	XX	0.00

LITTLE WHITE SALMON NATIONAL FISH HATCHERY

DATE	LOCATION	SPE	FISH/LB	AGE	DEN-IND	FLOW-IND	TEMP	DIS	LOSS/MO
01/23/89	5399LWS	URB	0.00	s	0.00	0.00	0.0	xx	0.00
02/07/89	5399LWS	scs	19.50	Y	0.26	0.95	37.0	BK	0.41
02/07/89	5399LWS	scs	19.50	Y	0.26	0.95	37.0	VN	0.41
02/24/89	5399LWS	URB	800.00	F	0.50	2.34	42.0	PCOS	0.00
02/24/89	5399LWS	URB	800.00	F	0.50	2.34	42.0	UW	0.00
03/01/89	5399LWS	scs	237.00	F	0.23	1.03	40.0	xx	0.50
03/01/89	5399LWS	scs	18.60	Y	0.35	1.27	40.0	BK	0.50
03/01/89	5399LWS	scs	18.60	Y	0.35	1.27	40.0	PEP1	0.50
03/01/89	5399LWS	scs	18.60	Y	0.35	1.27	40.0	PSCY	0.50
03/06/89	5399LWS	scs	18.00	Y	0.27	1.00	38.0	BK	0.00
03/06/89	5399LWS	scs	18.00	Y	0.27	1.00	38.0	VN	0.00
03/10/89	5399LWS	scs	370.00	F	0.73	1.74	44.0	VH	0.00
03/20/89	5399LWS	URB	550.00	F	0.52	2.92	46.0	XX	0.00
03/28/89	5399LWS	URB	450.00	F	0.69	3.23	44.0	PCOS	0.00
03/28/89	5399LWS	URB	450.00	F	0.69	3.23	44.0	BW	0.00
03/28/89	5399LWS	scs	15.00	Y	0.40	1.46	44.0	BK	0.00
03/28/89	5399LWS	scs	15.00	Y	0.40	1.46	44.0	PSCY	0.00
04/06/89	5399LWS	URB	428.00	F	0.59	3.35	45.0	XX	0.00
04/17/89	5399LWS	URB	330.00	F	0.19	1.09	46.0	XX	0.00
04/28/89	5399LWS	scs	66.00	F	0.54	2.19	46.0	XX	0.00
05/01/89	5399LWS	URB	273.00	F	0.43	2.45	47.0	XX	0.00
05/11/89	5399LWS	URB	220.00	F	0.49	2.78	46.0	XX	0.00
05/16/89	5399LWS	scs	120.00	F	0.29	1.52	47.0	VH	0.80
05/24/89	5399LWS	scs	110.00	F	0.30	1.58	47.0	VH	0.62
05/24/89	5399LWS	scs	110.00	F	0.30	1.58	47.0	PEP1	0.62
05/25/89	5399Lws	URB	165.00	F	0.38	2.17	46.0	XX	0.00
06/01/89	5399LWS	URB	153.60	F	0.39	2.04	47.0	XX	0.37
06/20/89	5399LWS	scs	45.20	F	0.37	1.51	48.0	xx	0.20
07/17/89	5399LWS	scs	0.06	B	0.00	0.00	0.0	BK	0.00
07/17/89	5399LWS	scs	0.06	B	0.00	0.00	0.0	SC	0.00
07/17/89	5399LWS	scs	0.06	B	0.00	0.00	0.0	BF	0.00
07/17/89	5399LWS	scs	0.06	B	0.00	0.00	0.0	BR	0.00
07/17/89	5399LWS	scs	0.06	B	0.00	0.00	0.0	VH	0.00
07/28/89	5399LWS	scs	44.00	F	0.19	1.00	47.0	PSCY	0.15
01/17/90	5399LWS	scs	21.00	Y	0.24	0.99	41.0	PCOS	0.40
01/17/90	5399LWS	scs	21.00	Y	0.24	0.99	41.0	PSCY	0.40
02/21/90	5399LWS	scs	19.50	Y	0.25	1.03	41.0		0.10
02/23/90	5399LWS	scs	531.00	F	0.22	1.13	43.0	BG	0.50
02/23/90	5399LWS	scs	531.00	F	0.22	1.13	43.0	DG	0.50
02/23/90	5399LWS	scs	531.00	F	0.22	1.13	43.0	UW	0.50
03/26/90	5399LWS	scs	17.00	Y	0.27	1.14	42.0	FS	0.10
03/26/90	5399LWS	scs	17.00	Y	0.27	1.14	42.0	PSCY	0.10
03/26/90	5399LWS	FCS	600.00	F	0.19	0.99	43.0	PCOS	0.30
04/27/90	5399LWS	scs	200.00	F	0.39	2.21	44.0	PEP1	0.50

SPRING CREEK NATIONAL FISH HATCHERY

DATE	LOCATION	SPE	FISH/LB	AGE	DEN-IND	FLOW-IND	TEMP	DIS	LOSS/MO
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01/12/89	5399SPCK	FCS	446.00	F	0.00	0.00	48.0	xx	0.00
02/13/89	5399SPCK	FCS	190.00	F	0.19	1.03	46.0	XX	0.00
03/23/89	5399SPCK	FCS	105.00	F	0.28	1.56	49.0	FS	0.00
03/27/89	5399SPCK	FCS	89.00	F	0.13	0.70	49.0	xx	0.00
04/04/89	5399SPCK	FCS	90.00	F	0.01	0.02	61.0	XX	0.00
05/09/89	5399SPCK	FCS	45.00	F	0.20	1.07	50.0	BK	0.00
05/11/89	5399SPCK	FCS	49.00	F	0.19	1.03	50.0	xx	0.00
06/06/89	5399SPCK		0.00		0.00	0.00	48.0	xx	0.00
09/14/89	5399SPCK	FCS	0.05	B	0.00	0.00	0.0	BK	0.00
09/14/89	5399SPCK	FCS	0.05	B	0.00	0.00	0.0	BR	0.00
12/26/89	5399SPCK	FCS	530.00	F	0.07	0.36	50.0	BA	2.10
12/26/89	5399SPCK	FCS	530.00	F	0.07	0.36	50.0	UW	2.10
01/25/90	5399SPCK	FCS	350.00	F	0.09	0.48	48.0	BA	1.50
04/26/90	5399SPCK	FCS	49.00	F	0.16	0.87	50.0	BR	0.40

WARM SPRINGS NATIONAL FISH HATCHERY

DATE	LOCATION	SPE	FISH/LB	AGE	DEN-IND	FLOW-IND	TEMP	DIS	LOSS/MO
01/10/89	439aWMSP	SCS	20.00	Y	0.29	1.16	38.0	TN	0.60
01/10/89	<b>4398WMSP</b>	scs	20.00	Y	0.29	1.16	38.0	BK	0.60
01/10/89	<b>4398WMSP</b>	SCS	10.00	Y	0.32	1.28	38.0	TN	0.60
01/10/89	<b>4398WMSP</b>	RBT	16.00	Y	0.12	0.45	38.0	xx	0.00
01/24/89	4398WMSP	SCS	10.00	Y	0.33	1.28	33.0	FS	0.70
01/24/89	4398WMSP	SCS	10.50	Y	0.33	1.28	33.0	BU	0.70
01/24/89	4398WMSP	SCS	1100.00	F	0.23	0.91	50.0	xx	0.00
02/16/89	<b>4398WMSP</b>	SCS	15.00	Y	0.14	0.54	36.0	BA	0.17
02/16/89	439aWMSP	SCS	15.00	Y	0.14	0.54	36.0	TN	0.17
02/16/89	439aWMSP	SCS	15.00	Y	0.14	0.54	36.0	PSCY	0.17
02/16/89	<b>4398WMSP</b>	scs	15.00	Y	0.14	0.54	36.0	TC	0.17
02/16/89	4398WMSP	SCS	600.00	F	0.44	1.72	48.0	XX	0.10
03/06/89	439aWMSP	SCS	9.80	Y	0.27	1.02	40.0	BK	0.00
03/15/89	<b>4398WMSP</b>	SCS	350.00	F	0.51	1.60	46.0	XX	0.00
03/15/89	4398WMSP	SCS	9.50	Y	0.27	1.03	40.0	TC	0.00
03/15/89	4398WMSP	SCS	9.50	Y	0.27	1.03	40.0	TN	0.00
03/15/89	4398WMSP	SCS	19.00	Y	0.22	0.83	40.0	PSCY	0.00
03/15/89	4398WMSP	SCS	19.00	Y	0.22	0.83	40.0	TC	0.00
03/15/89	4398WMSP	SCS	19.00	Y	0.22	0.83	40.0	TN	0.00
04/05/89	4398WMSP	SCS	150.00	F	0.78	2.47	46.0	XX	0.00
05/10/89	4398WMSP	SCS	100.00	F	0.09	0.29	50.0	PEP1	0.00
05/10/89	<b>4398WMSP</b>	scs	100.00	F	0.09	0.29	50.0	PSCY	0.00
05/10/89	4398WMSP	RBT	6.30	Y	0.22	0.70	50.0	MB	0.00
05/10/89	439aWMSP	RBT	6.30	Y	0.22	0.70	50.0	PTRC	0.00
05/10/89	<b>4398WMSP</b>	RBT	410.00	F	0.61	<b>1.58</b>	50.0	xx	0.00
05/24/89	4398WMSP	RBT	400.00	F	0.01	0.11	50.0	MB	0.00
05/24/89	4398WMSP	RBT	400.00	F	0.01	0.11	50.0	VH	0.00
05/24/89	<b>4398WMSP</b>	RBT	400.00	F	0.01	0.11	50.0	PTRC	0.00
06/07/89	<b>4398WMSP</b>	RBT	5.80	Y	0.23	0.73	52.0	XX	0.40
06/08/89	4398WMSP	<b>RBT</b>	1200.00	F	0.01	0.05	55.0	VH	0.00
07/10/89	439aWMSP	SCS	0.00		0.00	0.00	50.0	cs	0.01
07/11/89	<b>4398WMSP</b>	SCS	35.00	F	0.19	0.60	52.0	<b>PEPI</b>	0.20
07/11/89	4398WMSP	SCS	35.00	F	0.19	0.60	52.0	PSCY	0.20
07/11/89	<b>4398WMSP</b>	SCS	35.00	F	0.19	0.60	52.0	TC	0.20
07/11/89	4398WMSP	SCS	35.00	F	0.19	0.60	52.0	TN	0.20
07/11/89	4398WMSP	RBT	10.00	Y	0.21	0.66	52.0	TS	0.01
07/11/89	4398WMSP	RBT	10.00	Y	0.21	0.66	52.0	TG	0.01
07/11/89	4398WMSP	RBT	10.00	Y	0.21	0.66	52.0	TC	0.01
07/11/89	<b>4398WMSP</b>	RBT	10.00	Y	0.21	0.66	52.0	TN	0.01
07/11/89	4398WMSP	RBT	10.00	Y	0.21	0.66	52.0	PEP1	0.01
07/11/89	4398WMSP	RBT	10.00	Y	0.21	0.66	52.0	PSCY	0.01
07/11/89	<b>4398WMSP</b>	RBT	2.00	Y	0.36	1.16	52.0	PEP1	0.01
07/11/89	4398WMSP	RBT	2.00	Y	0.36	1.16	52.0	PSCY	0.01
07/11/89	<b>4398WMSP</b>	RBT	2.00	Y	0.36	1.16	52.0	TN	0.01
07/11/89	4398WMSP	RBT	2.00	Y	0.36	1.16	52.0	TC	0.01
07/11/89	4398WMSP	RBT	2.00	Y	0.36	1.16	52.0	PICH	0.01
07/11/89	<b>4398WMSP</b>	RBT	2.00	Y	0.36	1.16	52.0	TG	0.01
07/14/89	4398WMSP	SCS	0.00	B	0.00	0.00	50.0	cs	0.00
07/27/89	<b>4398WMSP</b>	scs	0.09	B	0.00	0.00	52.0	CS	1.00
07/27/89	<b>4398WMSP</b>	SCS	0.09	B	0.00	0.00	52.0	TN	1.00

FISH AND WILDLIFE SERVICE  
FISH DISEASE SUMMARY

DATE LOCATION SPE FISH/LB AGE DEN-IND FLOW-IND TEMP DIS LOSS/MO

08/15/89	4398WMSP	SCS	26.00	F	0.35	0.69	52.0	TN	0.10
08/15/89	4398WMSP	SCS	26.00	F	0.35	0.69	52.0	TS	0.10
08/15/89	4398WMSP	SCS	26.00	F	0.35	0.69	52.0	TC	0.10
08/15/89	4398WMSP	SCS	26.00	F	0.21	0.67	52.0	TN	0.10
08/15/89	4398WMSP	SCS	26.00	F	0.21	0.67	52.0	TS	0.10
08/15/89	4398WMSP	SCS	26.00	F	0.21	0.67	52.0	TC	0.10
08/15/89	4398WMSP	SCS	26.00	F	0.21	0.67	52.0	UE	0.10
08/15/89	439aWMSP	SCS	26.00	F	0.35	0.71	58.0	UE	0.10
08/15/89	4398WMSP	SCS	26.00	F	0.35	0.71	58.0	TN	0.10
08/15/89	4398WMSP	SCS	26.00	F	0.35	0.71	58.0	TS	0.10
08/15/89	4398WMSP	SCS	26.00	F	0.35	0.71	58.0	TC	0.10
08/15/89	4398WMSP	RBT	8.00	Y	0.31	0.61	52.0	PICH	0.13
08/15/89	4398WMSP	RBT	8.00	Y	0.31	0.61	52.0	PTRC	0.13
08/15/89	4398WMSP	SCS	26.00	F	0.35	0.69	52.0	UE	0.10
08/24/89	4398WMSP	SCS	0.05	B	0.00	0.00	0.0	VH	0.00
08/24/89	4398WMSP	SCS	0.05	B	0.00	0.00	0.0	BK	0.00
08/24/89	4398WMSP	SCS	0.05	B	0.00	0.00	0.0	BF	0.00
08/24/89	4398WMSP	SCS	0.05	B	0.00	0.00	0.0	SC	0.00
09/25/89	4398WMSP	SCS	17.40	Y	0.24	0.61	55.0	TS	0.00
09/25/89	4398WMSP	SCS	17.40	Y	0.24	0.61	55.0	TC	0.00
09/25/89	4398WMSP	SCS	17.40	Y	0.24	0.61	55.0	TN	0.00
10/10/89	4398WMSP	SCS	10.00	Y	0.32	1.28	38.0	TC	0.60
10/10/89	4398WMSP	SCS	15.00	Y	0.32	0.82	57.0	TS	0.00
10/10/89	4398WMSP	SCS	15.00	Y	0.32	0.82	57.0	TC	0.00
10/10/89	439aWMSP	SCS	15.00	Y	0.32	0.82	57.0	TN	0.00
11/16/89	4398WMSP	SCS	20.00	Y	0.33	1.25	48.0	TC	0.12
01/17/90	4398WMSP	SCS	18.10	Y	0.48	2.01	35.0	TC	0.00
01/17/90	4398WMSP	SCS	18.10	Y	0.48	2.01	35.0	TN	0.00
01/17/90	4398WMSP	SCS	18.10	Y	0.48	2.01	35.0	PSCY	0.00
01/17/90	4398WMSP	SCS	la.10	Y	0.48	2.01	35.0	PEP1	0.00
01/17/90	4398WMSP	SCS	800.00	F	0.51	3.33	46.0	UW	0.00
01/17/90	4398WMSP	SCS	18.10	Y	0.40	1.65	35.0	TN	0.00
01/17/90	4398WMSP	SCS	la.10	Y	0.40	1.65	35.0	PTRC	0.00
02/26/90	439aWMSP	SCS	22.00	Y	0.40	1.40	40.0	PEPI	0.00
02/26/90	4398WMSP	SCS	22.00	Y	0.40	1.40	40.0	PSCY	0.00
02/26/90	4398WMSP	SCS	22.00	Y	0.40	1.40	40.0	PTRC	0.00
02/26/90	4398WMSP	SCS	20.00	Y	0.27	1.04	40.0	PEP1	0.00
02/26/90	439aWMSP	SCS	20.00	Y	0.27	1.04	40.0	PSCY	0.00
02/26/90	4398WMSP	SCS	20.00	Y	0.27	1.04	40.0	TN	0.00
02/26/90	439aWMSP	SCS	20.00	Y	0.27	1.04	40.0	PTRC	0.00
03/13/90	4398WMSP	SCS	21.00	Y	0.37	1.29	38.0	PCOS	0.60
03/13/90	4398WMSP	SCS	21.00	Y	0.37	1.29	38.0	PTRC	0.60
03/13/90	4398WMSP	SCS	21.00	Y	0.37	1.29	38.0	PEPI	0.60
03/13/90	4398WMSP	SCS	21.00	Y	0.37	1.29	38.0	TC	0.60
05/01/90	4398WMSP	SCS	100.00	F	0.09	0.30	48.0	PEPI	0.00
05/01/90	4398WMSP	SCS	100.00	F	0.09	0.30	48.0	PSCY	0.00
05/01/90	4398WMSP	SCS	100.00	F	0.09	0.30	48.0	TC	0.00

WILLARD NATIONAL FISH HATCHERY

DATE      LOCATION SPE FISH/LB AGE DEN-IND FLOW-IND TEMP DIS LOSS/MO

01/19/89	5399WILL	COS	1600.00	F	0.28	1.04	41.0	xx	0.00
01/26/89	<b>5399WILL</b>	cos	21.00	Y	0.45	1.39	41.0	BW	0.21
02/28/89	5399WILL	COS	1430.00	F	0.34	1.25	41.0	XX	0.50
02/28/89	<b>5399WILL</b>	cos	20.00	Y	0.46	1.43	41.0	PEP1	0.30
02/28/89	<b>5399WILL</b>	cos	20.00	Y	0.46	1.43	41.0	<b>PSCY</b>	0.30
02/28/89	5399WILL	COS	20.00	Y	0.46	1.43	41.0	BW	0.30
03/14/89	5399WILL	COS	16.90	Y	0.52	1.60	40.0	XX	0.00
03/28/89	<b>5399WILL</b>	cos	870.00	F	0.45	1.40	43.0	xx	0.00
03/28/89	5399WILL	COS	16.70	Y	0.51	1.59	43.0	xx	0.00
04/26/89	5399WILL	COS	300.00	F	0.93	2.89	43.0	XX	0.00
05/30/89	5399WILL	COS	142.00	F	0.83	1.96	43.0	<b>XX</b>	0.00
06/29/89	5399WILL	COS	85.00	F	0.17	0.53	44.0	DS	0.15
07/28/89	5399WILL	COS	50.00	F	0.24	0.73	46.0	DS	0.10
10/17/89	5399WILL	COS	28.00	F	0.34	1.07	5.0	BK	0.04
12/20/89	5399WILL	COS	23.00	Y	0.39	1.22	40.0	<b>VN</b>	0.04
01/24/90	5399WILL	COS	21.00	Y	0.42	1.31	41.0	BK	0.30
02/28/90	5399WILL	COS	19.60	Y	0.44	1.35	40.0	BW	0.07
02/28/90	5399WILL	COS	19.60	T	0.44	1.35	40.0	BK	0.07
03/13/90	5399WILL	COS	17.00	Y	0.48	1.50	43.0	BK	0.10
03/29/90	<b>5399WILL</b>	cos	660.00	F	0.67	2.08	43.0	BA	0.54
03/29/90	5399WILL	COS	17.50	Y	0.47	1.46	43.0	BK	0.10
03/29/90	5399WILL	COS	17.50	Y	0.47	1.46	43.0	PEP1	0.10
04/13/90	<b>5399WILL</b>	cos	16.00	Y	0.50	1.55	44.0	BK	0.10
04/27/90	5399WILL	COS	280.00	F	1.03	3.19	43.0	DD	0.50

**WINTHROP NATIONAL FISH HATCHERY**

DATE      LOCATION SPE FISH/LB AGE DEN-IND FLOW-IND TEMP DIS LOSS/MO

01/11/89	5399WNRP	SCS	650.00	F	0.34	1.48	48.0	PCOS	0.00
01/11/89	<b>5399WNRP</b>	SCS	18.00	Y	0.28	0.84	37.0	<b>PCOS</b>	0.00
02/15/89	5399WNRP	CUT	110.00	F	0.09	0.66	46.0	XX	0.33
02/15/89	5399WNRP	RBT	12.30	Y	0.08	0.57	40.0	<b>XX</b>	0.05
02/15/89	5399WNRP	BKT	2000.00	F	0.80	1.36	48.0	XX	50.00
02/15/89	5399WNRP	SCS	17.90	Y	0.25	0.73	40.0	BK	0.34
02/15/89	5399WNRP	SCS	426.00	F	0.30	2.17	48.0	<b>XX</b>	0.61
03/10/89	5399WNRP	SCS	379.00	F	0.32	2.32	48.0	PCOS	0.50
03/10/89	5399WNRP	RBT	0.00	s	0.00	0.00	48.0	xx	0.00
03/10/89	5399WNRP	SCS	17.20	Y	0.18	0.54	34.0	BK	0.35
03/10/89	5399WNRP	BKT	1500.00	S	0.00	0.00	48.0	EG	0.00
03/10/89	<b>5399WNRP</b>	BKT	<b>1500.00</b>	S	0.00	0.00	48.0	BU	0.00
04/05/89	5399WNRP	BKT	0.00	F	0.00	0.00	0.0	<b>PCOS</b>	0.00
04/05/89	5399WNRP	SCS	15.80	Y	0.27	0.80	42.1	BK	0.87
05/09/89	5399WNRP	SCS	157.00	F	0.19	0.55	42.1	XX	9.70
05/09/89	5399WNRP	BKT	707.00	F	0.00	0.00	48.0	DD	0.00
05/09/89	5399WNRP	RBT	559.00	F	0.10	0.75	48.0	XX	2.40
06/05/89	5399WNRP	SCS	0.00	F	0.00	0.00	0.0	xx	0.00
06/05/89	5399WNRP	BKT	0.00	F	0.00	0.00	0.0	xx	0.00
07/10/89	5399WNRP	RBT	140.00	F	0.13	0.98	50.0	XX	0.13
07/10/89	5399WNRP	BKT	137.00	F	0.00	24.35	51.0	XX	0.12
07/10/89	5399WNRP	SCS	61.00	F	0.08	0.27	50.0	XX	0.08
08/15/89	5399WNRP	SCS	43.70	F	0.14	0.47	53.1	BR	0.00
08/15/89	5399WNRP	BKT	84.00	F	2.38	13.08	50.0	XX	0.00
09/07/89	5399WNRP	BKT	48.00	F	0.18	1.31	50.0	BG	11.30
09/07/89	5399WNRP	RBT	48.90	F	0.12	0.87	54.0	XX	0.00
10/03/89	5399WNRP	SCS	25.70	F	0.23	0.69	51.5	BK	0.00
10/03/89	5399WNRP	SCS	25.70	F	0.23	0.69	51.5	BR	0.00
10/03/89	<b>5399WNRP</b>	CUT	625.00	<b>F</b>	1.50	1.65	50.0	PCOS	0.00
10/03/89	5399WNRP	BKT	30.00	F	0.27	2.39	51.5	XX	0.00
11/07/89	<b>5399WNRP</b>	SCS	27.00	F	0.13	0.73	50.0	FS	0.02
11/07/89	5399WNRP	SCS	27.00	F	0.13	0.73	50.0	<b>VN</b>	0.02
12/12/89	5399WNRP	SCS	24.90	Y	0.15	0.69	44.5	<b>VN</b>	1.73
01/11/90	5399WNRP	SCS	0.00		0.00	0.00	0.0	xx	0.00
01/11/90	5399WNRP	SCS	22.30	Y	0.22	0.73	40.0	xx	0.00
02/21/90	5399WNRP	SCS	534.00	F	0.51	1.83	48.0	UW	0.16
02/21/90	5399WNRP	scs	23.10	Y	0.17	0.90	38.0	<b>PCOS</b>	0.15
02/21/90	5399WNRP	KOE	0.00	F	0 .00	0.00	0.0	xx	0.00
03/15/90	5399WNRP	SCS	445.00	F	0.15	1.17	48.0	xx	0.15
04/16/90	5399WNRP	KOE	2100.00	S	11.60	12.48	47.0	BG	2.17
04/16/90	5399WNRP	SCS	23.10	Y	0.21	0.63	43.0	XX	0.24
04/16/90	5399WNRP	SCS	198.00	F	0.58	2.01	47.0	BG	0.28
05/07/90	5399WNRP	SCS	150.00	F	0.27	0.71	46.0	XX	2.64
05/07/90	5399WNRP	KOE	1300.00	S	1.19	1.99	49.0	xx	1.21

DEFINITIONS/CODINGDISEASE

Definition-Coded value for a disease.

Coding-

**XX** = No Disease Observed

Bacteria

BR	- <b>Yersinia Ruckeri</b>
BK	- <b>R. Salmoninarum</b>
BF	- <b>A. Salmonicida</b>
BG	- Bacterial Gill Disease
BC	- <b>Flexibacter Columnaris</b>
BW	- <b>Cytophaga Psychrophila</b>
BA	- Aeromonads
BT	- <b>Mycabacterium Sp.</b>
BV	= <b>Vibrio Anguillarum</b>
BS	- <b>Salmonella</b>
BO	= Chills Oregon Bleb, Strawberry
BP	= Pseudomonads
BU	- Unidentified Bacteria
BAGD	= Aeromonad Gill Disease

Copepods

cs - Salmincola

Environment

EG	- Environmental Bubble Disease
ES	= Environmental Sunburn

Fungal

FP	= <b>Phoma Herbarrum</b>
FS	- Saprolegnia

Mussels

MB - Glochidia

Nematodes

NC = Cystidicola

Nutritional

DD	- <b>Nutritional Drop Out</b>
DG	- Nutritional Gill Disease
DS	- Nutritional Sunburn
DN	- Malnutrition
DC	- Nutritional Cataract

### Ova

OF = Fungus  
OB = Blanks  
OS = Soft Shell

### Protozoa

**PCOS** = Costia  
**PTRC** = Trichodina  
**PICH** = Ichthyophthirius  
**PAMB** = Gill Amoeba  
**PEPI** = Epistylus  
**PSCY** = Scyphidia  
**PCOL** = Colponema  
**PTRY** = Trichophyia  
**PCRY** = Cryptobria  
**PBOD** = Bodomonads

### Sporozoa

SC = *Ceratomyxa Shasta*  
SW = *Myxosoma Cerebralis*  
SX = *Myxidium Minteri*  
SM = *Myxobolus Insidiosus*  
SH = *Henneguya*  
SD = *Dermocystidium*  
**SL** = *Chloromyxum Majori*  
SP = PKD

### Tremadotoda

TE = *Diplostomulum Spacthaceum*  
TG = *Gyrodactylus*  
TD = *Dactylogyros*  
TS = *Sanguinicola*  
TB = *Neascus*  
TN = *Nanophyetus Salmincola*

### Underdetermined Etiology

**UE** = Epitheliocystis  
us = Strawberry Disease  
**USC** = Scoliosis  
**UB** = Bleb  
**UC** = Chills  
**UW** = White Spot  
EC = Chills Oregon Bleb, Strawberry  
**PU** = Unidentified Parasite

### Viruses

VH	= IHN
VP	= IPN
VE	= VHS
VN	= VEN
VR	= Herpes
W	= Unidentified Virus

### LOCATION

Definition-Location where work is being accomplished or where fish are being evaluated or released.

Coding- S-digit code:

First **2 digits**, General Area

16	= Idaho
32	= Nevada
41	= Oregon marine
43	= Oregon fresh water
52	= Washington marine
53	= Washington fresh water
99	= Other

Second two digits, Local Area

### Washington Fresh Water

99	= AT THE HATCHERY
	If not at the hatchery the first 2 digits of the Water Resources Inventory Area (Table 22.5) are used to identify all other WA recovery areas except the Columbia River which is 25.
27	= Washington lakes

### Oregon

25	= Oregon fresh water (Columbia system)
35	= Oregon fresh water (other fresh water areas)
37	= Oregon lakes
98	= Oregon hatchery racks

### Idaho

25	= Idaho fresh water (Columbia system)
77	= Idaho lakes
95	= Idaho hatchery racks

Last 4 digits, Sub-area

### Washington Marine (01-13)

Coding for Washington commercial marine areas can be as little as a repeat of area **coes** 1 thru 13 plus sub-area designations (**4B, 8A, 9A**, etc.) or can be more specific locations such as tribal area designations.

For sport areas, the **same** codes apply **(01-13)** although more specific codes may be allowed.

### Washington Fresh Water (01-24)

Coding for Washington fresh water areas based on the WDF Water Resource Inventory Areas code designations. The last 4 characters of the WRIA will serve as the sub-area code.

#### Washington Hatcheries

**NOOF** = **Nooksack** WDF  
**HOOF** = Hoodspout WDG  
**SESP** = Sea Springs  
**ELSN** = **Elson Creek**  
**QUIL** = **Quilcene**  
**WLCT** = Walcott Slough  
**QUIN** = **Quinault**  
**MAKA** = **Makah**  
**ABER** = Abernathy  
**SPCK** = Spring Creek  
**WILL** = Willard  
**LWS** = Little White Salmon  
**CRSN** = Carson  
**CSDP** = Carson Depot Springs  
**LVNW** = Leavenworth  
**ENT** = Entiat  
**WNRP** = Winthrop  
**LSCK** = Lonesome Creek  
**CTCK** = Chalatt Creek  
**QNLK** = Quinault Lake  
**KLCK** = **Kalama Creek**  
**LELW** = Lower **Elwha**  
**TPCK** = Tulalip Creek  
**CGCK** = Cowling Creek  
**AGCK** = Armstrong Creek  
**SKCK** = Skookum Creek  
**CHCG** = Chambers Creek Game Dept. Hatchery  
**ABEG** = Aberdeen Game Dept. Hatchery  
**SALM** = QDNR Salmon River  
**GRCK** = **Grovers Creek**  
**MNCK** = Mission Creek  
**LSP** = **Lummi Sea Ponds**  
**PUYG** = Puyallup Game Dept. Hatchery  
**BELG** = Bellingham Game Dept. Hatchery  
**CHIM** = Chimicum School  
**DIRU** = Diru Creek

COWL = **Cowlitz** State Hatchery  
 BSRP = Bear Springs Rearing Pond  
 GRNF = Green River WDF  
 PUYF = Puyallup WDF  
 PGB = Port Gamble  
**SKAF** = Skagit WDG  
 DESF = Deschutes WDF  
 SQPN = Squaxin Salt Pens  
 ISQF = Issaquah WDF  
**SKYF** = Skykomish WDF  
 KECK = Keta Creek  
**ENIT** = Enetai Creek  
 SOLF = Solduc WDF  
 WAAT = **Waatch** Creek  
**KALF** = **Kalama** WDF  
**SAMF** = **Samish** WDF  
 TEN = Ten O'clock Creek  
 GEOF = George Adams WDF  
 BOLD = Boulder Creek  
 HOKO = Hoka Rearing Pond  
 MRST = Marrowstone  
 PGB = Little Boston  
**QNRR** = Raft River  
 SUGP = Gorst Rearing Pond  
**SUSP** = Agate Pass Sea Ponds  
**SUWP** = Webster's Pond, Dogfish Creek

#### Columbia River System (25)

0000	= Columbia River below Bonneville
2000	= Columbia River above Bonneville
0001-0999	= OR tribes below Bonneville
1001-1999	= WA tribes below Bonneville
2001-2999	= OR tribes above Bonneville
3001-3999	= WA tribes above Bonneville
5000	= Snake River <b>mainstem</b> (WA)
5001-5999	= Snake River tribes (WA)
6000	= Snake River <b>mainstem</b> (ID)
6001-6999	= Snake River tribes (ID)
7001-7999	= Snake River tribes (OR)

#### Oregon Fresh Water (30 & 35)

Columbia River (see above)  
 Other fresh water areas:  
 0001 = Little Nestucca = **ODFW** code 24.2  
 0015 = Rogue River = ODFW code 18.15  
 0016 = Umpqua River = ODFW code 18.16  
 0050 = Siletz River = ODFW codes 16.50, 16.5  
 0185 = **Siuslaw** River = ODFW code 18.185

## Oregon Hatchery Racks (98)

**WMSP** - Warm Springs

**EGCK** - Eagle Creek

Others to be defined as necessary.

## Idaho Fresh Water

See Columbia System, other areas as necessary.

## Idaho Hatcheries

**DWOR** - **Dworshak**

**KOOS** - Kooskia

**HGMN** - **Hagerman**

## MARK TYPE

Definition-Identification for type of mark and/or tag found on a particular group of fish.

Coding -

<b>CW</b>	-	Full length <b>CWT</b> and complete adipose clip
<b>CN</b>	-	Full length CWT and no adipose clip
<b>CA</b>	-	Full length CWT and partial adipose clip
<b>Hw</b>	-	Half length CWT and complete adipose clip
<b>HN</b>	-	Half length CWT and no adipose clip
<b>HA</b>	-	Half length CWT and partial adipose clip
<b>CC</b>	-	Color coded tag
<b>XX</b>	-	X-ray tag
<b>RE</b>	-	Rare earth tag
<b>FB</b>	-	Freeze brand
<b>TC</b>	-	Tetracycline
<b>D</b>	-	Dorsal fin clip
<b>PA</b>	-	Partial adipose clip, no CWT
<b>AD</b>	-	Completed adipose clip, no CWT
<b>AN</b>	-	Anal fin clip
<b>LV</b>	-	Left ventral fin clip
<b>RV</b>	-	Right ventral fin clip
<b>LP</b>	-	Left pectoral fin clip
<b>RP</b>	-	Right pectoral fin clip
<b>LM</b>	-	Left maxillary clip
<b>RM</b>	-	Right maxillary clip
<b>CD</b>	-	Caudal fin clip
<b>DT</b>	-	Dart tag
<b>CG</b>	-	Full length CWT and complete adipose clip - right ventral
<b>CH</b>	-	Full length CWT and complete adipose clip - left ventral
<b>AG</b>	-	Adipose clip - no CWT - right ventral
<b>AH</b>	-	Adipose clip - no CWT - left ventral

Multiple marks will be defined as necessary.

### METHOD OF COUNTING

Coding-

01 = Retention rate X electronic count of release  
02 = Retention rate X partial electronic count of releases  
03 = Retention rate X (- originally tagged-observed clipped mortalities)  
04 = Retention rate X water displacement  
05 = Retention rate X weight of release  
**06** = Retention rate X (- originally tagged-estimated mortalities)  
07 = Retention rate X mark-recapture estimate  
08 = Retention rate X best guess  
09 = Electronic count of tagged release  
10 = Machine counter  
11 = **Human** counter  
12 = Retention rate X number originally tagged  
13 = Number originally tagged minus **mortalities**  
14 = Weight sample  
15 = Water displacement  
16 = Electronic count  
17 = Weight sample minus mortality  
18 = Machine count minus mortality  
19 = Number originally counted

### SPECIES

Definition-PFMIS species code.

Coding-

CHS = 702 = Chum  
cos = 703 = Coho  
SOS = 721 = Sockeye  
PKS = 723 = Pink  
CUR = 730 = Chinook of unknown race  
**SUC** = 731 = Summer chinook  
FCS = 732 = Fall chinook  
WCS = 733 = Winter chinook  
scs = 734 = Spring chinook  
WST = 742 = Winter steelhead  
SST = 743 = Summer steelhead  
RBT = 501 = Rainbow trout  
CUT = 511 = Cutthroat trout  
KOE = 525 = Kokanee salmon  
**LAT** = 523 = Lake trout  
DVT = 531 = Dolly **Varden**  
ATS = 741 = Atlantic salmon  
BKT = 522 = Brook trout  
BNT = 521 = Brown trout  
**URB** = 735 = Up river bright FCS  
LFC = 736 = Late fall chinook